

APRIL 1961

Material Handling Engineering

Established in 1945 as FLOW Magazine

No-damage
shipping with
inflatable
dunnage

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Comparative
analysis of
order picking
systems

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Material
control from
the systems
viewpoint

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Has
LP-Gas
been
oversold?

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WHAT'S YOUR HANDLING INFORMATION IQ?

PAGE 57

STEVENS RICE
UNIVERSITY MICROFILMS
313 NORTH FIRST ST
ANN ARBOR MICH FIZ

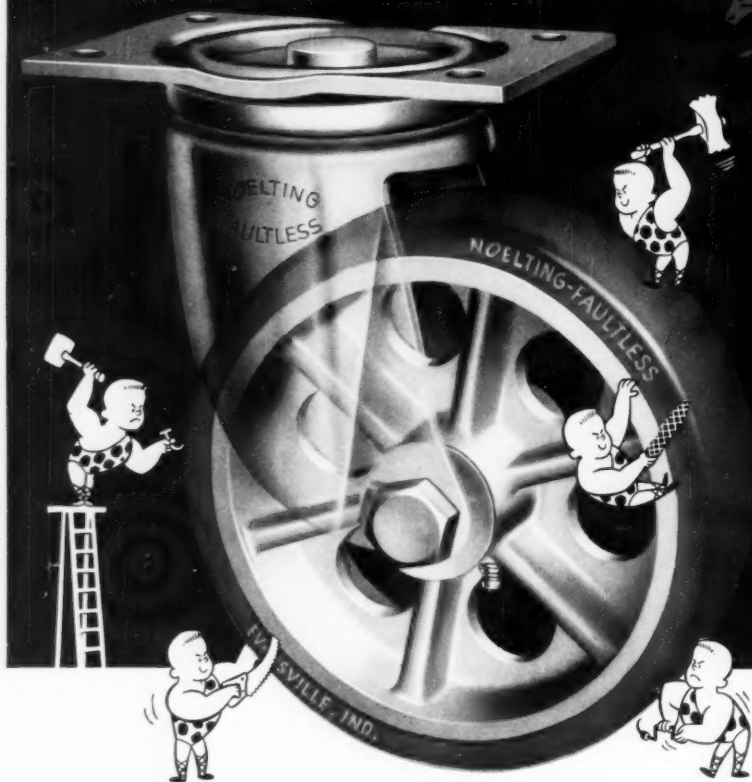


AN INDUSTRIAL PUBLISHING CORPORATION MAGAZINE

MHI Eastern States Show Philadelphia May 9-11 29
Match Material to System for Successful Pneumatic Conveying .. 60
Mechanized System Breaks Tradition To Cut Costs 68

Here's Caster Wheel Performance
that saves money...

Faultless DURO TRED WHEELS



● Resist wear, tear, abuse 4 to 10 times longer than ordinary wheel treads.

● Ride loads easily, smoothly over the roughest floors.

● Carry heavy payloads—up to 3,500 lbs. per wheel.

● Protect floors, loads and equipment.

✱ **DURO TRED** Wheels are composed of the new miracle, polyurethane elastomer bonded to a rugged semi-steel core.

With Duro/Tred Wheels, your caster maintenance costs can be chopped considerably. Special properties of *polyurethane*—strength, resilience, wearing quality—mean Faultless Duro/Tred Wheels cut costly downtime of castered equipment in your plant. New Faultless Duro/Tred Wheels are manufactured in 5", 6", 8", 10" and 12" diameter wheel

sizes to fit most larger Faultless swivel and rigid industrial casters. *Free*, fact-filled literature sheet detailing specifications and sizes of Duro/Tred Wheels is available from Faultless or your local Faultless Industrial Distributor, who stocks a wide range of casters at his warehouse for immediate shipment.



Faultless Caster Corporation

EVANSVILLE 7, INDIANA

Branch Offices in principal cities; see the Yellow Pages of the telephone book under "Casters." Canada: Stratford, Ontario.

Circle 49 on Reader Service Card





GOOD YEAR

RUGGED!

New NEOTHANE Tire can tote 2 to 4 times the load 4 times longer

Stack the NEOTHANE up against any conventional tires — under the worst conditions this remarkable Goodyear industrial “solid” will outlast the others as much as 4 times, even when lugging 2 to 4 times the load.

Secret of this unmatched toughness is a new Goodyear polyurethane development that has amazing durability combined with resiliency. Photo above taken through heavy plate glass shows that NEOTHANE tires roll over metal chips, splinters, even broken glass with virtually no gouging or cutting. They won't swell or turn

spongy when driven through water, oil, grease, solvents or acids.

Tough as they are, however, NEOTHANE tires “give” enough to stand up under rough going. And they're harmless to polished floors. If your service is really tough and if your tire dollars aren't buying enough mileage, why not try NEOTHANE? Full details are on tap at your Goodyear Dealer's. Or write Goodyear, Industrial Tire Sales, Akron 16, Ohio. Remember—lots of good things come from Goodyear.

Buy and Specify NEOTHANE Industrial Tires by

GOOD YEAR

Neothane—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND
Circle 55 on Reader Service Card

PALLETAINERS[®] AT WORK....

CUTTING production COSTS!



Assembly Line Handling In Georgia Plant

McDONOUGH Power Equipment, Inc., manufactures Snappin' Turtle power lawn mowers and the authentic one-half scale reproduction of the 1910 model T, as well as equipment for the textile industry.

Founded in 1890 as Southern Saw Works, the modern plant is

now located 28 miles south of Atlanta and employs approximately 125 people.

Because of rapid growth, materials handling problems soon became apparent. Supplying parts to the operators on the assembly line became a serious bottleneck. Parts were moved from various machine

positions and to the assembly area in oil drums which had the tops cut off. This caused many accidents, and delays in manufacture due to complete loss of visibility of contents.

After careful study McDonough decided on a handling program employing Palletainers, manufactured by Union Steel Company and supplied through Wrenn Brothers, the Atlanta distributor.

Now, both raw material and machined parts are stored in Palletainers. These are moved to interim storage areas near the final assembly line, and then directly to the line itself. Gates in the containers allow the assemblers to pick out the specific part, but they know exactly how many they have, eliminating shutdowns. With multiple lines and models, visibility and consistent tare (for weight count) become vital features.

Palletainers are used entirely within the plant, handling all parts by fork truck.



● Palletainers handle *anything* better! They increase your production efficiencies, improve your plant's appearance and quickly pay for themselves in manhours and space saved. Palletainers are practically indestructible... built to endure rough, fast handling for years to come. They are available in a wide range of sizes, types, styles and loading capacities from 250, 500, 1250, 2000, 4000 to 6000 pounds per unit.

Why not see for yourself how USP Palletainers... or the new small size 'Juniors'—could save time, money and effort in *your* plant.

You may try regular Palletainers — or the small size 'Juniors' in your plant on a 60-day memo billing basis. Your obligation is freight only!

Gentlemen:

Please send me complete information and literature on USP Palletainers.

NAME

TITLE

COMPANY

ADDRESS

CITY ZONE STATE

Please have your Palletainer representative contact me ☐



**UNION STEEL
PRODUCTS CO.**
400 N. BERRIEN STREET
ALBION, MICHIGAN

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reader's guide to

APRIL 1961

Material Handling Engineering

volume 16 number 4

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PACKAGING AND SHIPPING IDEAS OF THE MONTH 82

Specially designed pallet can handle both cases and kegs.



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Heavy Duty CLEVELAND CONTAINERS...

for both

Inter-Plant and Regular Shipments

There's real economy when you transfer, store, or ship in these heavy duty containers and cores:

First — because of the rugged construction, as illustrated above with self-locking metal ends, they can be used over and over again. The heavy wall is spirally wound with multiple layers of high grade paperboard, closely butted and evenly bonded to give an extra measure of strength and utility.

Second — our strategically located plants and modern equipment make prompt delivery possible at lower unit cost.

Made in lengths and diameters to meet the needs of specific products. Typical uses are the packaging of metal strips, shafts, rods, tubes and other metal parts. They are also suitable when used as cores for paper rolls and fabrics, bodies for reels, and liners for metal drums.

Write for our latest packaging brochure.

THE CLEVELAND CONTAINER COMPANY

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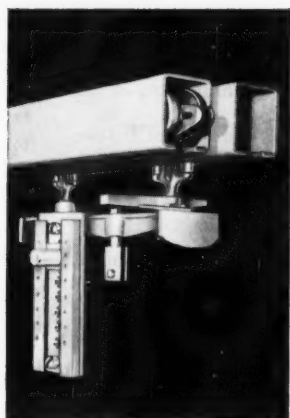
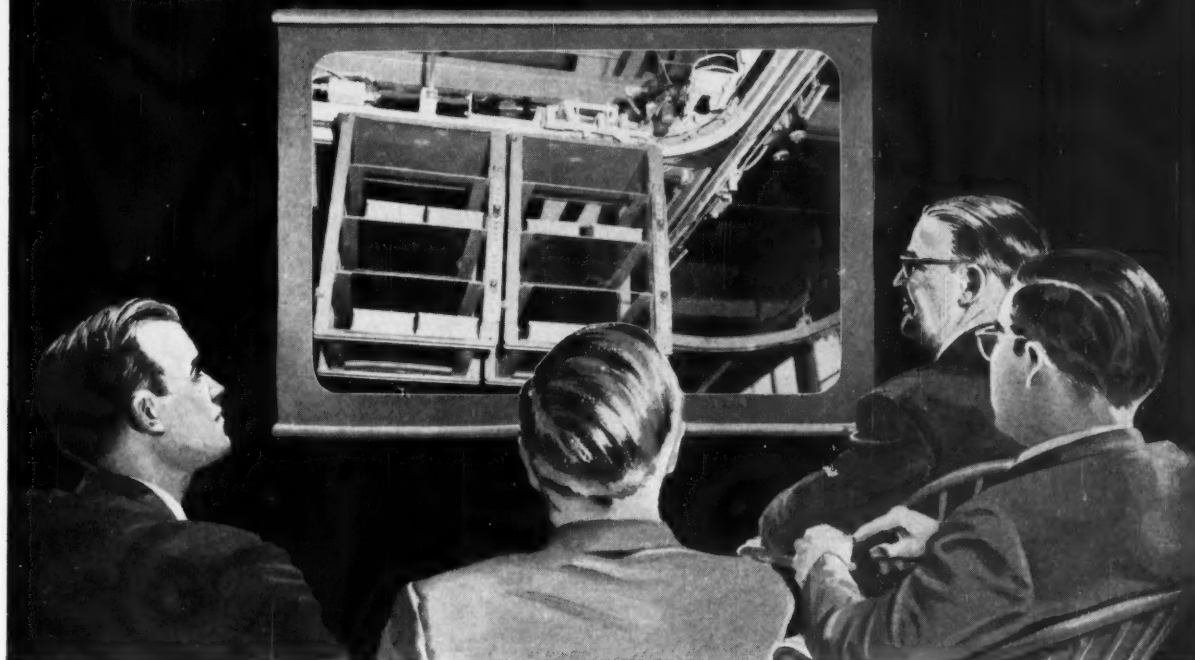
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INDEXED by Engineering Index, Inc.

MICROFILMED copies of Material Handling Engineering are available from University Microfilms, 313 North First Street, Ann Arbor, Michigan.

MATERIAL HANDLING ENGINEERING

See the cost-saving advantages of an **R** "TWIN-TRAK" OVERHEAD AUTOMATIC **W** DISPATCH SYSTEM demonstrated in your office!



An R-W "TWIN-TRAK" Overhead Automatic Dispatch System consists of one or more Power Track and as many Storage or Load Tracks as desired plus Switches, Carriers, Accessories and Power Equipment. "TWIN-TRAK" Systems are economical to install and maintain . . . easy to expand, alter or relocate as necessary.

The handling of materials offers American industry its greatest cost-cutting frontier and reduced costs will be accomplished only with a "true" integrated materials handling system that coordinates all production functions on a plant wide basis. A new movie has just been produced that graphically demonstrates how R-W "TWIN-TRAK" Automatic Dispatch Systems meet this need. "TWIN-TRAK" is a completely automatic conveying system that selectively conveys parts, components and products throughout all production processes. Parts and components may be inventoried in overhead storage banks and then automatically selected and transported where they are needed—when they are needed. Write today to arrange for a showing of this film in your office.

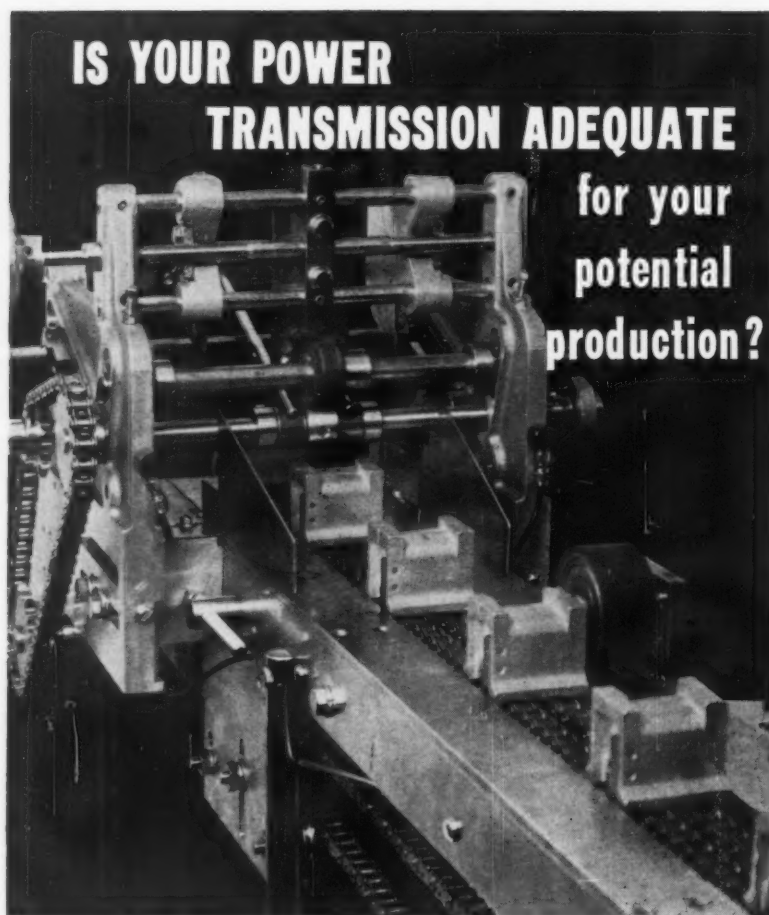


Richards-Wilcox

MANUFACTURING COMPANY
MATERIALS HANDLING DIVISION

420 W. THIRD ST. • AURORA, ILL. • Branches in all Principal Cities

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If you're not getting over 98% of the power furnished by the driving sprocket, you're increasing costly production and maintenance time. With Acme roller chain drives, there is practically no loss of ratio of energy between driving and driven members.

Acme chains are rigidly built of hardened steel, heat treated according to specific requirements of each part to assure long service with a minimum of maintenance, vital to maximum production.

Step up production by specifying Acme chains, available in all sizes from $\frac{1}{4}$ " pitch to $2\frac{1}{2}$ " pitch.

See your Industrial Distributor for off-the-shelf service on chains, sprockets, flexible couplings and attachments.



Write Dept. 29-O
for new ill. 100 page catalog
with engineering section.



RELIABLE CHAIN DRIVES FOR ALL INDUSTRIES

ROLLER CHAINS, SPROCKETS, CONVEYOR CHAINS, FLEXIBLE COUPLINGS, ATTACHMENTS. (Special and Standard)

Circle 1 on Reader Service Card

CALENDAR OF EVENTS

April 3-7

MHEDA Distribution Warehousing
Course
National Material Handling Center
Newport, R.I.

April 10-13

AMA 30th National Packaging
Exposition
Lakefront Exposition Hall
Chicago

April 17-21

MHEDA Course: Metal Forming &
Finishing Industry
National Material Handling Center
Newport, R.I.

April 18

Meeting
Hoist Manufacturers Association
Statler-Hilton
Detroit

May 9-11

MHI Eastern States Show
Trade & Convention Center
Philadelphia

May 11-13

12th Annual Conference and
Convention
American Institute of Industrial
Engineers
Sheraton Cadillac Hotel
Detroit

June 1-3

MHEDA Seventh Annual Convention
Denver-Hilton Hotel
Denver

June 11-23

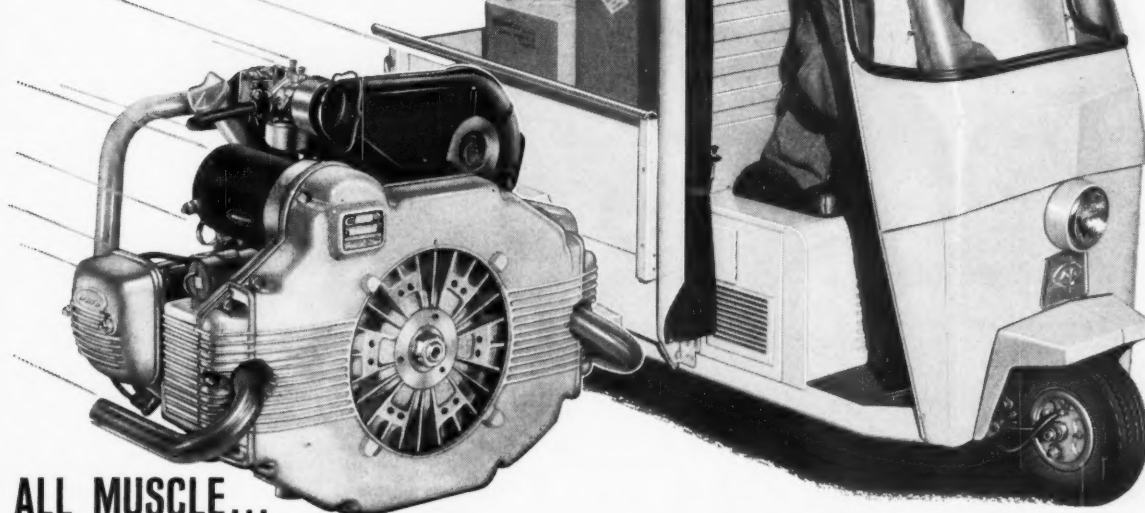
Industrial Management Center
Courses
Lake Placid Club
Essex County, N.Y.

June 28-30

Joint Automatic Control Conference
The American Society of Mechanical
Engineers
University of Colorado
Boulder, Colorado

MATERIAL HANDLING ENGINEERING

*Nearest thing yet to
cost-free
transportation!*



ALL MUSCLE...

TWICE *the* POWER!

Now with New Die-Cast Aluminum, 18 HP Engine...

CUSHMAN TRUCKSTER.

It meets every challenge . . . the Cushman Truckster with its all-new Twin Super Husky die-cast aluminum, two-cylinder engine. It offers more live power than ever before available in light vehicles . . . delivers a new high level of efficient performance.

The Truckster also now offers many other new advances—such as an extra heavy duty clutch, synchro-mesh transmission and auxiliary transmission*—to go along with these proven advantages:

- An "all-muscle" chassis and body with 800 pound payload capacity.
- The greatest light hauling economy—low initial investment, minimum maintenance and operating costs.
- All-around utility, inside the plant or out-of-doors, both on and off the street.

For applications with lower power requirements, the Truckster is available with new Super Husky 9 HP engine.

**Optional; all-weather cab also optional*

*Ask your dealer for demonstration or
write for FREE Cost Analysis Report
and descriptive literature*



CUSHMAN MOTORS

1014 No. 21st, Lincoln, Nebraska

A subsidiary of Outboard Marine Corporation

Actual Truckster Cost Analysis now available

A coast-to-coast survey of typical Truckster users not only proves greatest economy in every light hauling application, but reveals the wide range of uses to which the Truckster is being put. Survey results have been compiled in condensed form and are available upon request. Here are two examples:

ON-THE-STREET OPERATION

Blue print company in Texas, using Truckster for deliveries, reports operating cost of 0.93 cent per mile; maintenance cost of 0.73 cent per mile.

IN-PLANT OPERATION

Shipyards in Connecticut, using three Trucksters for movement of tools and equipment, reports 1.3 cents per mile operating cost; only routine maintenance.

Please send Cost Analysis Report
and descriptive literature.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

B.F. Goodrich





BEFORE THE B.F. GOODRICH TW ANALYSIS MAN stepped in, chipped brick was knocking out a tire every 2 weeks at Bowerston Shale Co., Hanover, Ohio. Now, with BFG Steel Protected tires on the job, tire service has jumped to 700 hours on the original tread—and many tires can be retreaded.

B.F. Goodrich Steel Protected tires take the bite out of brick handling

TW ANALYSIS MAN'S RECOMMENDATIONS RESULT IN LONGER TIRE SERVICE, LOWER TIRE COSTS

The production system at Bowerston Shale Co. calls for fork lift trucks to transport 3700-lb. loads of brick from kiln to storage area, then to trucks and freight cars. An efficient system, except that chipped bricks on concrete floors were forever putting the bite on tires and the company pocketbook. "We could count on a new tire every time a truck ran over chipped brick," says the plant superintendent.

To stop rising downtime and run-away costs, the company called in the B.F. Goodrich Tire & Wheel Analysis Man. He studied the situation, then recommended a switch to B.F. Goodrich Steel Protected pneumatic industrial tires. They're built with 2 plies of steel cable under the tread that shrug off impacts and defy punctures. Brick chips have yet to put the bite on BFG Steel Protected tires. They've stood up so well that many can be retreaded!

This case history is typical of the savings B.F. Goodrich Tire & Wheel Analysis Men offer. Without cost or obliga-

tion, the TW Analysis Man will study your setup—floors, loads, equipment, etc. Then he'll recommend the BFG tires that will give longest service at lowest cost—advice that is unbiased because B.F. Goodrich makes a complete line of industrial tires. Why not take advantage of this free BFG service? Mail the coupon today.

A special B.F. Goodrich consulting service is available to manufacturers of materials handling equipment.

A FREE B.F. Goodrich TW Analysis can save you as much as 50% on industrial tires, as much as 20% on maintenance costs. Mail the coupon today.

*The B.F. Goodrich Company
Dept. TW-836, Akron 18, Ohio*

Please send me additional information on your free Tire and Wheel Analysis Plan.

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

***Specify B.F. Goodrich tires
when ordering new equipment***

Circle 54 on Reader Service Card



NEWS

ROUNDUP

Startling new vacuum handling

HYSTER Co. has developed what it calls a major breakthrough in the use of vacuum for handling a wide variety of materials. The firm will demonstrate the device to representatives of 15 top corporations the middle of this month in Hyster's Danville, Ill., plant. MHE will carry an exclusive story in June. We'll have photographs to show you how the device works, plus a detailed report on the demonstration. The device uses internal and external vacuum pressure to handle appliances, cased goods, bagged goods, and paper rolls. Exact nature of the device is being withheld until production engineering is complete and units are available for sale. We can tell you, however, that all you'll see is a compact power unit behind the driver's seat and a face plate close to the upright. Hyster claims these advantages:

- No clamp arms.
- Better maneuverability.
- Face plate close to the upright.
- Weighs less than other attachments.
- Less operator skill needed.
- Faster, easier operating cycles.
- Unit loads handled without other equipment.

Project Upgrade Seminar

MHE'S PROJECT UPGRADE series will be the basis of a seminar to be held in Cleveland on April 28. Four experts will tell the MH man what he must know to prepare himself for the high-level material control jobs on the horizon.

E. Ralph Sims, Jr., management consultant, E. Ralph Sims, Jr., & Associates, will talk on the economics and theory of material control. C. D. Heaton, manager, manufacturing services, Westinghouse Electric Corporation, will explain the management viewpoint on MH control problems. Dr. Melvin Salvesson, president, Alwac Computer Division, El-tronics, Inc., will explain advanced theoretical techniques. James R. Karl, control specialist, General Electric Co., will discuss controls for MH systems.

Top attendance at MHI show

MORE THAN 8,000 attended the Material Handling Institute Show in San Francisco. MHI

Managing Director L. West Shea said this broke the records of the first two shows, in Boston and Louisville. He said nearly 3,000 showed up the first day even though it was Washington's Birthday, with plants and offices closed. Many exhibitors, said Shea, called it the best show in which they ever participated. There were more than 120 exhibitors.

Numerical control impact on handling

NUMERICAL CONTROL probably has the greatest effect on material handling in limited run production. It cuts down handling between jobs and the need for much storage. These are some of the conclusions drawn by Associate Editor Dick Dietz who attended the Automation and Numerical Control Seminar held by the American Society of Tool and Manufacturing Engineers in Hartford, Conn.

Said E. V. Grumman, The Bullard Co.: Numerical control in the metal industries provides a sizeable reduction in lead time, therefore a sizeable reduction in inventory. It also avoids inprocess inventory. We found 90% of the time between operations is spent waiting to get to the next machine. Only 4% is spent in handling and inspection.

Said R. D. Keller, Pratt & Whitney Co.: In one case we found total floor-to-floor machining time less than handling time previously required to move a part from one machine to another.

Said Charles F. Carter Jr., The Heald Machine Co.: Projected figures indicate that 50% of all machine tools will be numerically controlled by 1965.

Two MHEDA courses in April

THE MATERIAL HANDLING EQUIPMENT DISTRIBUTORS ASSOCIATION will hold two courses this month at its National Training Center in Newport, Rhode Island. A five-day course on handling in metal forming and finishing will be April 17-21, featuring industry-approved, comprehensive sessions.

A distribution warehousing course was scheduled for April 3-7. Lecturers include Wil-

Continued on page 12



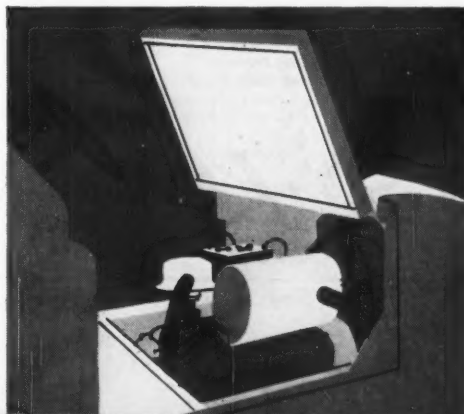
TOWMOTOR'S ON THE MOVE

—setting the pace with good functional design, plenty of power, unusual agility! Integrating frame, body, engine, pumps and lift components for most effective mass-handling. Introducing new advances in centralized control, full vision seating, fatigue-free steering. Keep moving with Towmotor fork lift trucks—made only by TOWMOTOR CORPORATION, CLEVELAND 12, OHIO.



Circle 123 on Reader Service Card

Quick, easy access to entire engine compartment is a significant feature of new Towmotor "Pace-Maker" Series fork lift trucks (above), with load capacities up to 12,000 pounds. Tilt-back seat, hinged hood, slip-socketed panels expose service parts in 30 seconds without tools.

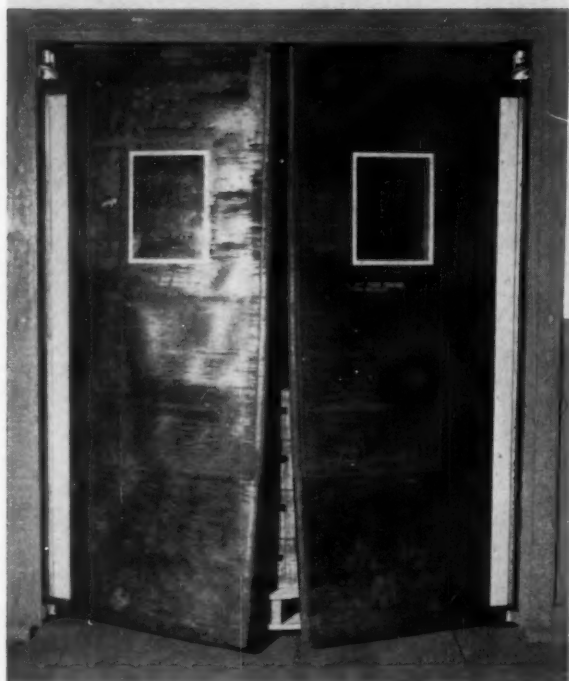


WHO USES

Rubbair®

the true door . . .
not a curtain.

Door?



Stock photo of a Rubbair Door installation showing how Rubbair Door flexes on impact and absorbs shock.

FIRESTONE INDUSTRIAL PRODUCTS COMPANY
Fall River, Massachusetts

READ THIS ACTUAL CASE HISTORY:

"... I am sorry for the delay in answering your . . . letter with reference to the Rubbair Door installation in our plant. Because of the location of this door we would not care to have photographs made and published.

However, we are glad to tell you that the door did accomplish the purpose that we had hoped it would do. It was installed on a very busy passageway where both lift trucks and a conveyor operated. The trucks themselves and the conveyor cars actually pushed the doors open and in this manner we were able to permit a minimum of dirt and dust to travel out of the room. We have had almost no difficulty with the doors since they were installed in 1955."

A. D. STEWART, Purchasing Agent

RUBBAIR DOORS flex on impact and absorb high traffic punishment from fork trucks, material handling equipment, boxes and packing cases. They are built to "take it" and they give you longer factory-tested door life and extremely low maintenance costs. How do your present factory doors measure up?

RUBBAIR DOORS assure trouble free operation with . . .

- Flexible Construction
- Shatter-proof Windows
- Rugged V-Com Hinges
- Safety Cushion Nose
- Scuff-resistant Wear Panels
- Positive Air Seals

If you have an industrial or warehouse door problem, let us help you solve it. Write us about it or send for free illustrated catalog.

Stic-Klip®

MANUFACTURING CO. INC.
RUBBAIR® DOOR DIVISION
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Cambridge 40, Mass.

Distributorships available in protected territories.

NEWS ROUNDUP

liam M. Willitts, Western Electric Co.; George Stryker, Westinghouse Corp.; Nelson P. Greller, Nelson P. Greller Associates; Morton Bromfield, Bromfield Associates; John D. Wheeler, Richard Muther & Associates; Robert P. Brady, Facilities Planning Service; John Mount, Insurance Co. of North America; Bud Blake, Admos Inc.; Allan Harvey, Dasol Corp., and Prof. James R. Bright.

Joint management for school?

Two material handling associations were invited to help manage the National Training Center. MHEDA President Bob Arnold announced that the center's Board of Management has invited officers of the American Material Handling Society and the Material Handling Institute to consider the possibility of joint management of the center along with MHEDA. Said Arnold: "The Board of Management feels this may be the best way to insure industrywide promotion and support of the center."

The May schedule includes Brewery & Distribution Warehouse handling, starting May 8, and Food Canning & Processing handling, starting May 22.

In other business, the 1961 MHEDA National Convention will be June 1-3 in Denver, with a theme: Better Methods for Profit. Speakers will include Calvin D. Johnson, American Trucking Assn.; H. Merrill Bowman, T. B. Wood's Sons Co.; Leonard M. Waserbly, Industrial Distributor News, and Robert F. Moody, president of the Material Handling Institute. Convention chairman is Jack D. Patten, director of MHEDA Region 8.

To keep pace in packaging

MAXIMUM USE of manufacturing space and reduced cost and effort in material handling are essential if package engineering is to keep up with advances in industry. So said Leland R. Srigley, director of industrial engineering for Parke Davis & Co. He spoke to the Packaging Institute Forum on The New Look in Packaging. "The packaging operation would be in the kingpin position . . . all functions such as warehousing, product manufacturing, and material supplying, to name a few, would be considered only as they relate to packaging," he said. He gave as an example the flow of material from the warehouse to processing and

Continued on page 16

Over 1000
Standard
Models —
A Truck
for Almost
Every Need



Steel and Aluminum
2 Wheelers for
Cases and Cartons



Wood and Steel
2 Wheelers
for Freight



"Auto-Load"
Barrel Trucks



All Types of Dollies
for Boxes and Cases



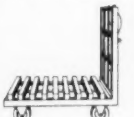
Dollies for Cylindrical
and Odd Shaped Items



Triform & Box Trucks
for Packages & Bundles



Shelf and Tray Trucks
for Sub Assemblies



Palletless Handling
Dragline
and Trailer Trucks



Trailers



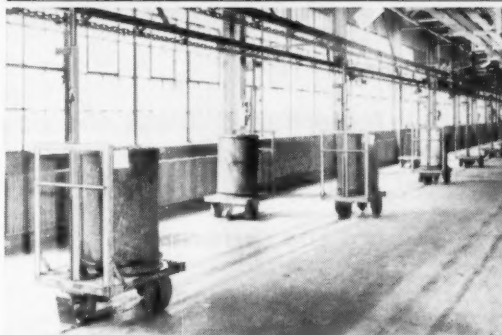
Wagon Trucks



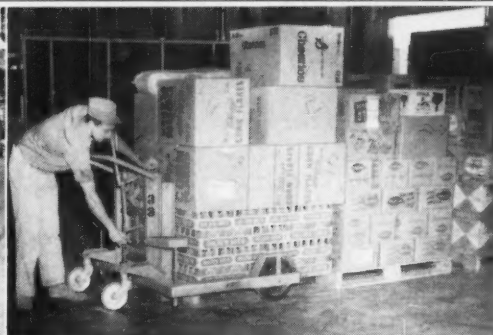
Aluminum, Hardwood
& Steel Platform Trucks

Here's how the right equipment

INCREASES PRODUCTION ... SAVES MAN HOURS



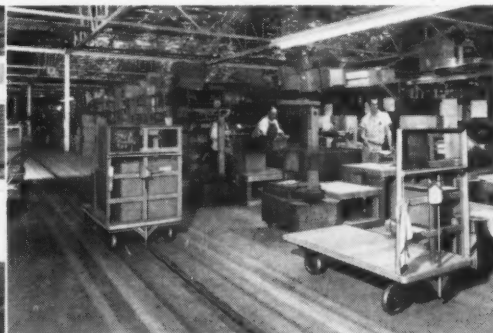
\$22,500.00 Annual Savings reported by plant using 250 Nutting dragline trucks in place of fork and crane operation. These trucks move 144 tons of forged products per day.



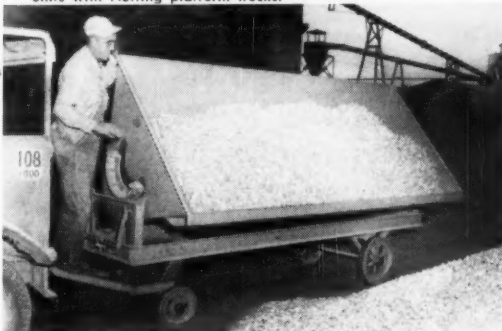
3-in-1 Truck — Serves as a dragline, order picking and hydraulically operated pallet truck in warehousing and distribution operations.



12 to 15% Immediate DECREASE in handling costs and sizeable reduction in OS&D's when this terminal replaced powered units with Nutting platform trucks.



No Traffic Snarls — Nutting dragline trucks powered by under-floor or overhead draglines provide smooth one way, damage free flow from order picking to shipping and return.



Bigger "Pay" Loads — Nutting hopper trailers for efficient transport of "shavings" — powdered and granulated materials. Complete discharge side dump.

EXPERIENCE PLUS CREATIVE ENGINEERING

... Nutting has the men, the experience and equipment to help you increase production and save man hours. Not only do we design and manufacture the right equipment, but we can show you how to use it to your best advantage.

Certainly it's worth looking into — and it costs nothing to talk to your Nutting representative. Find out more about the advantages of Nutting products and services. Write — use Reader Service Card or coupon below.

CLIP AND MAIL TODAY

Nutting

TRUCK AND CASTER COMPANY

104 West Division Street • Faribault, Minnesota



Please send me complete information on:

- | | | |
|--|--|--|
| <input type="checkbox"/> 2 Wheelers | <input type="checkbox"/> Platform Trucks | <input type="checkbox"/> Dollies |
| <input type="checkbox"/> Dragline Trucks | <input type="checkbox"/> Trailers | <input type="checkbox"/> 3-in-1 Trucks |
| <input type="checkbox"/> Shelf Trucks | <input type="checkbox"/> Triform Trucks | <input type="checkbox"/> Wagon Trucks |
| <input type="checkbox"/> Other _____ | | |

NAME AND TITLE _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____



FREE! Caster and Floor Truck Manufacturers' Association Engineering and Purchasing Plan book. Tells how to select, apply and integrate this type of equipment. Company letterhead only, please.

VISIT BOOTHS 510-512, MAY 9-11, M.H.I. SHOW — PHILADELPHIA

Circle 88 on Reader Service Card

Have you taken a good look at

There's a difference in loaders. You may have heard about the new Cat wheel loaders and thought, "Here's just another line of loaders—what can they do for me that my present equipment can't? What's the difference in them?" If that's what you think, take a good look. There's a big difference.

THERE'S A DIFFERENCE IN PERFORMANCE—only Caterpillar wheel loaders have automatic positioners that set the bucket or tine loading angle while the operator is maneuvering into position, and lift and stop the bucket automatically while the operator is driving to the bin or dump area. They speed up every cycle, do part of the operator's work for him automatically. Cat wheel loaders have fast power shift transmissions that give fast, smooth shifting forward, reverse, 1st and 2nd speeds. Travel or work speed range selector also shifts from two- to four-wheel drive. Controls are power boosted for easy operation, fast response.

Cat loaders offer you dependable Cat Diesel Engines that operate on low-cost furnace oil—optional gasoline engines on the two smaller models.

THERE'S A DIFFERENCE IN SAFETY—the operator never had it so good or so safe. He mounts a Cat loader up three wide steps, no climbing over tires or struggling up ladders. Fenders protect him. He's comfortable, confident and safe; and so are the men working around him. Because of the excellent visibility from a Cat loader, the operator can see where he's going and what he's doing through every part of the cycle. Safety men notice that the lift arms and hydraulic cylinders are all in front of the operator, not moving up and down on each side of him. And besides safety, the design provides extremely long reach and high lift.

THERE'S A DIFFERENCE IN SERVICE—Caterpillar Dealers are accustomed to providing service on an around-the-clock basis to their customers. Their



FORK LIFT in warehouse miscellaneous handling. This 922 can work in only 8 feet of aisle space.



2 YD. BUCKET is standard—note the 944's long reach. Material handled: shale-clay at the Virginia Lightweight Aggregate Corp.

the NEW CAT WHEEL LOADERS?

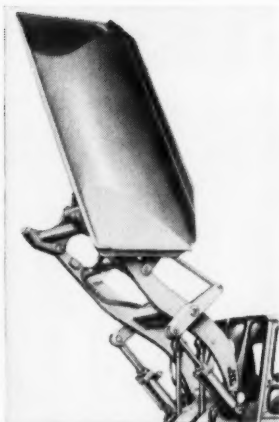
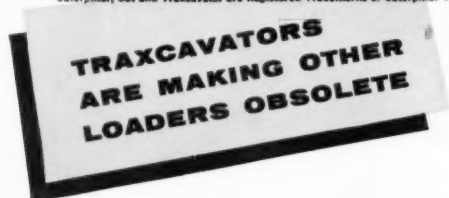
factory-trained service staffs know the importance of keeping equipment running. You can count on your Cat Dealer for expert service, any time, anywhere. Genuine Cat parts are always available. The Cat loader you buy today will have a parts stock behind it as long as you're using the machine.

Shouldn't you take a longer look?

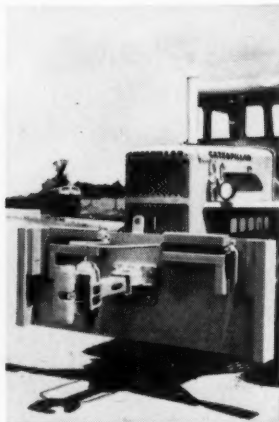
We'll gladly send you more information and complete specifications on the new Caterpillar wheel loaders. Just send in the coupon or, better yet, look in the Yellow Pages and call your nearby Caterpillar Dealer. He knows heavy equipment and has some good answers for your material handling problems! Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.



SIDE DUMP BUCKET—another Caterpillar exclusive—permits the rig to dump to left, without turning, or forward.



FREIGHT CAR COUPLER and pusher is an example of a special attachment made by a Caterpillar Dealer.

3 MODELS

to match any job!

- 966—2¾ cu. yd. standard bucket—140 flywheel HP
Dumping reach @ 7' height: 57"
Maximum lift: 12'10"
- 944—2 cu. yd. standard bucket—105 flywheel HP
Dumping reach @ 7' height: 51"
Maximum lift: 12'
- 922—1¼ cu. yd. standard bucket—80 flywheel HP
Dumping reach @ 7' height: 41"
Maximum lift: 11'2"

ATTACHMENTS

for bulk material handling

Whatever you'd like to move, load, unload, stockpile, stack or dig with a wheel loader, there's most likely a Traxcavator attachment to help you do the job. If there isn't, just tell your Caterpillar Dealer what you want from a machine—he has the facilities to help develop an attachment that meets your specific needs.

Current attachments include buckets to handle any weight or type of material, side dump buckets, bulldozers, forks, snowplows, snow blowers, pipelayers, backhoes and cabs.

CATERPILLAR TRACTOR CO.

Dept. L-236, General Offices, Peoria, Illinois, U. S. A.

Gentlemen: Please send me more information on Traxcavator wheel loaders for industrial bulk materials handling.

I am particularly interested in _____
(model number)

for handling _____
(names of materials regularly handled)

We presently use _____
(type of equipment) (model)

_____ (bucket size or capacity)

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Telephone _____ Extension _____



New Rubber-Armored, Rubber-Hinged **CLARK**



DURADOR

Takes Pounding in Stride!

New self-closing DURADOR takes all the punishment your fork truck jockeys can dish out. Permanently-bonded rubber coating over sturdy door panels prevents gouging, splintering.

DURADOR rides with the force of the blow — doesn't resist it. Full-length flexible hinges prevent misaligning — return DURADOR to closed position every time, reducing drafts. Combines the best of a rigid door with a rubber curtain. Functions silently with no moving parts to go haywire. Needs **no** maintenance. Round, shatter-proof windows let driver see what's on the other side.

DURADOR comes in all stock and intermediate sizes. Applies easily at **any** doorway. Isn't this the door you've been wanting? Write for Architects' specifications and details.

CLARK DOOR
COMPANY, INC. (since 1878)

514 Hunterdon St.
Newark 8, N. J.

Makers of Prest-O-Matic and Shock Absorber Doors
Circle 34 on Reader Service Card

NEWS ROUNDUP

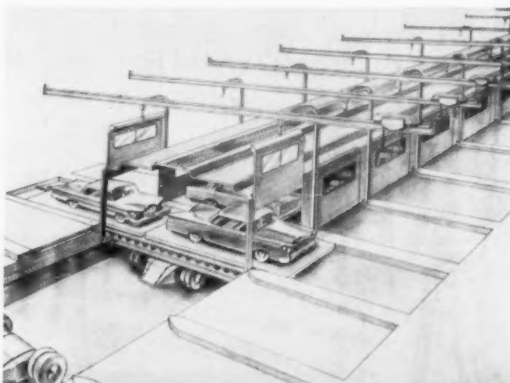
then to packaging, with the warehouse as part of the process, neither an afterthought nor a nuisance.

Keeping up to date on fuel cells

ALLIS-CHALMERS offers a fuel cell demonstration kit for \$9.75 postpaid. It's designed primarily as a teaching aid. The fuel is alcohol; oxidant, hydrogen peroxide; electrolyte, potassium or sodium hydroxide. Catalysts are platinum and silver. The cell will run a 1½-volt motor for about 15 minutes on one fueling.

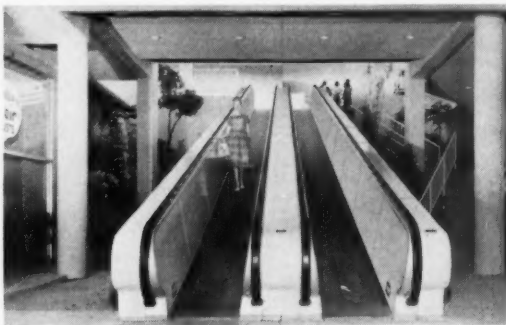
Some ideas for moving people

A HIGH-SPEED ELECTRIC highway system could carry your car and nine others in trains moved along on rollers powered by individual motors. At a station, your car on a dolly moves into



the train, unloading the car getting off at that station. Westinghouse Electric Corp. predicts speeds up to 150 mph, utter safety and reliability.

TWO SPEEDRAMP passenger conveyors carry 7,200 an hour at College Grove Center, re-



gional shopping center in San Diego. They take passengers 75 ft. up a 13½-ft. incline, be-

Continued on page 21

MATERIAL HANDLING ENGINEERING

IT COSTS LESS

To Move Parts Between Operations

THIS WAY

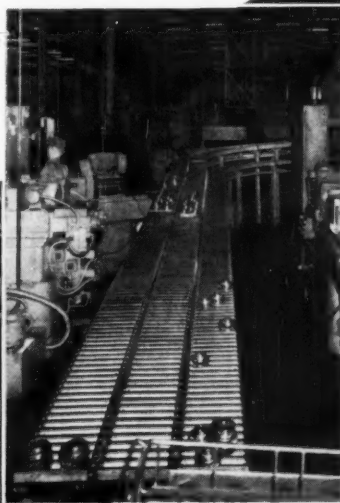
This Olson Conveyor system saves thousands of man-hours yearly for a large automobile parts manufacturer. Roller conveyors, belt conveyors and chutes do all the "leg-work" moving automatic transmission planet carriers between operations. No truckers are needed . . . and there's no loss of machine operators' valuable time. The illustrations show why.



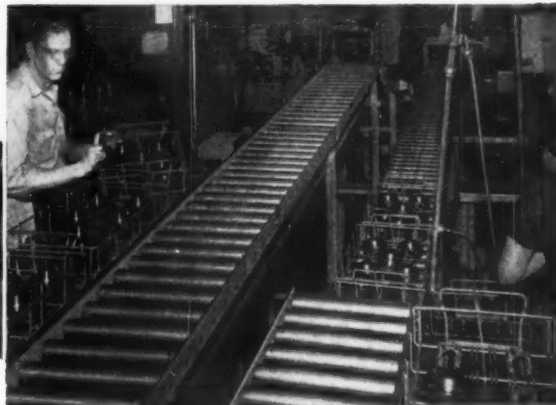
Castings from chucks travel down Olson belt conveyors (rear), converge on roller conveyor for trip to broaching department.

Three roller conveyor lines keep battery of boring machines supplied with semi-finished castings. Extended conveyor ends serve as storage.

Line in foreground supplies grinder with basketed castings. From there, parts move along on the lower line to another department.



Parts in baskets move between various finishing operations on two roller lines while loose parts on right emerge from a grinding operation.



Why not talk to your Olson representative about the time and labor savings possible in your plant with and Olson conveyor system. For general plant ideas, request Catalog 1000-C.

OLSON CONVEYORS

SAMUEL OLSON MFG. CO., Inc.

DIVISION OF CHERRY-BURRELL CORPORATION
2426 Bloomingdale Avenue, Chicago 47, Illinois

Circle 91 on Reader Service Card

"On the waterfront...

it's 8:22 p.m. . . . the ship is loaded
. . . sailing time is dawn tomorrow. We loaded 2,200 tons of cargo
in her hold today, starting at sun-up. Tomorrow there'll be another
ship . . . another day of lifting, hauling, storing.

"When you work like that from day
to day, you need a truck that can stand the gaff . . . you need a truck
that can handle the load with ease and put it where you want it—fast.
You need a Clark to work with."



Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek, Michigan

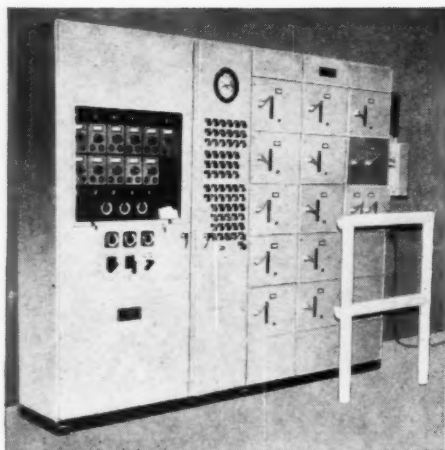


*For full details,
see your local Clark Dealer
or circle 77 on reader service card*

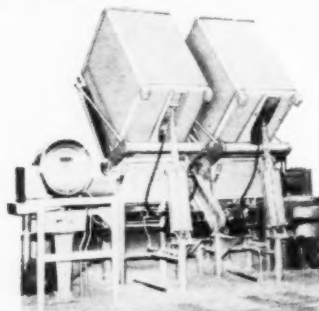
if it's in bulk...

TOTE SYSTEM*

and only Tote
will handle it
in-plant or inter-plant



Automatic control panel programmed to weigh 12 ingredients from 12 Tote Discharge Tilts into one mixer.



Two Tote Bins discharging from Tote Tilts into automatic weigh hoppers.

with the
efficiency and economy
of automation

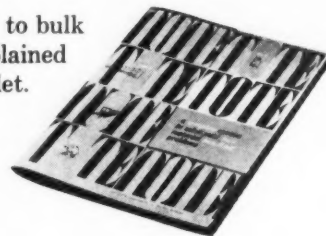
the flexibility and versatility
of unit containers,

and the product protection
of sealed containers

TOTE is a complete, mechanical, fully automatic system based on metal containers plus filling and discharging equipment.

The Tote System answers to bulk handling problems are explained in detail in this new booklet.

Write for it TODAY



TOTE SYSTEM, INCORPORATED

630 So. 7th, Beatrice, Nebraska

Subsidiary of Hoover Ball and Bearing Company

*TOTE AND TOTE SYSTEM Reg. U. S. Pat. Off.

Circle 122 on Reader Service Card

NEWS ROUNDUP

tween a general mall and lower shipping level. The conveyors, built by Stephens-Adamson and featuring Goodyear belts, have a floating comb plate that protects against catching spike heels on women's high fashion shoes.

AN ELEVATED MONORAIL rapid transit system can be built for \$5 million a mile, compared with \$20 million a mile for subways. The system, devised by 18 French industrial and financial firms, includes a track carried by concrete-covered steel supports, rubber-tired power trucks that run up to 60 mph inside the



track, and a 123-passenger car suspended from two trucks. Advantages: it's quiet, fast, needs minimum superstructure.

Seek catalogs on casters

CASTER AND WHEEL MAKERS are asked to send two each of their catalogs to Wright Air Development Division, Wright-Patterson Air Force Base. The Department of Defense has asked the division to study casters to determine whether classifying them is possible or desirable. If so, the military will work with industry to establish a single specification. The Caster and Floor Truck Manufacturers Association sees a high degree of standardization for casters as a possible result.

MH consultants name officers

THE ASSOCIATION OF PROFESSIONAL MATERIAL HANDLING CONSULTANTS (APMHC) has elected Irving M. Footlik president. Other officers include John B. Day, first vice president; Walter B. Friedman, membership vice president; Norman B. Shikes, vice president; Rich-

Continued on page 24

SUPERIOR OPERATION AT LOWER COST



MULTITON
FULLY HYDRAULIC
PALLET TRUCKS
2200-3300-4400 POUNDS CAPACITY

SUPERIOR

LIFT SYSTEM ■ Leakproof, one-unit hydraulic system — machined oil passages ■ magnetic oil filter ■ overload, overflow valves ■ all valves accessible from outside ■ hard chrome-plated pistons ■ honed cylinders.

SUPERIOR

CONTROL ■ Hand-operated maximum 7½" lift in three strokes ■ lowering speed remains constant ■ pallet entry and exit rollers.

SUPERIOR

CONSTRUCTION ■ Torsion-proof hardened joints ■ box-section type push rods ■ knee-action axle mount ■ taper roller bearings on load rollers ■ low, tapered forks for maximum clearance.

SUPERIOR

EXTRAS ■ Exclusive shoe-type brake ■ variety of wheels to fit every requirement ■ all standard fork-lengths ■ skid adapters.

OTHER PRECISION-BUILT MULTITON EQUIPMENT IN A WIDE RANGE OF CAPACITIES, INCLUDES . . . ELECTRIC PALLET TRUCKS ■ HYDRAULIC AND MECHANICAL SKID TRUCKS ■ HYDRAULIC LIFT TRUCKS ■ POWERED PLATFORM TRUCKS ■ SPECIAL PURPOSE TRUCKS & OTHER EQUIPMENT



... AND FAMOUS MULTITON ROLLER SKIDS TWO MEN CAN MOVE HEAVY MACHINES AND EQUIPMENT

up to 300 tons, with Multiton Roller Skids and suitable tractive power. They lay own track and swivel easily in close quarters. Junior Kit available for loads to 6000 lbs.

For full information or free demonstration of Multiton equipment, write:

STOKVIS MULTITON CORP.

18 SECATOAG AVE., DEPT. M-4 PORT WASHINGTON, NEW YORK
In Canada: Griswold Engineering Ltd., Montreal and Toronto

Circle 118 on Reader Service Card



Diagnosis:
Premature Rim Separation!

Cure: None! (for solid tires in this condition)

Remedy: Smart operators specify MONARCH SOLIDS
made with exclusive MONOLOK* process!

Hundreds of industrial tires fail every day because they are used under conditions for which they were not designed. Result . . . dollars lost for downtime, excessive maintenance and early replacement. Consider your requirements . . . do they call for truck operation over loose scrap . . . through brine and acid solutions . . . over rough surfaces . . . or under conditions of excessive heat? These are the critical operating factors that cause premature rim separation. Check with your Monarch representative today . . . he will prove to you that MONARCH MONOLOK tires will last longer in your plant.



10185 MR



THE
MONARCH
RUBBER COMPANY

210 Lincoln Park
Hartville, Ohio

*MONOLOK . . . Monarch's revolutionary new process bonds a tough new rubber to metal permanently. Both Mono-Cushion and Universal tires are made by this method.

923 Fisher Building
Detroit 2, Mich.

4140 West Fullerton
Chicago 39, Ill.

Western Warehouse
Reno, Nevada

Circle 78 on Reader Service Card

MATERIAL HANDLING ENGINEERING

All 'special'
problems;
yet all are
solved by
30 standard
**LYNCH
ROBO-
LIFTS**



When otherwise good
conveyors cannot handle
foods, drugs, hardware,
chemicals... powders, solids,
granules in the very very
gentle, very very
sanitary way required...
with intake and discharge
positions wherever
required, Leaders Look
To **LYNCH ROBO-LIFT**.
Call the Lynch engineers.
Whether it's handling
raw materials, in process
materials, or feeding
a Robo-Wrap or other
packaging machine... tell
us all about your problem.
Your most difficult problems
are our best opportunities.



30 STANDARD MODELS—CAPACITIES: from 1.0 cfm to 40 cfm; 90 or 70 degree elevating angle; 10, 15, 20, 24 and 30 inch bucket sizes, stainless steel, or mild carbon steel; top and underdumps, height and length to meet any requirement.

ENGINEERING SERVICES: Should your materials handling problem be a troublesome one, send us the details. Perhaps one of our 30 standard Robo-Lifts will do the job. Specifications for special enclosures, drives, feeds and discharge arrangements on request.

LEADERS LOOK TO LYNCH—FOR MACHINES THAT PACKAGE ALMOST EVERYTHING!

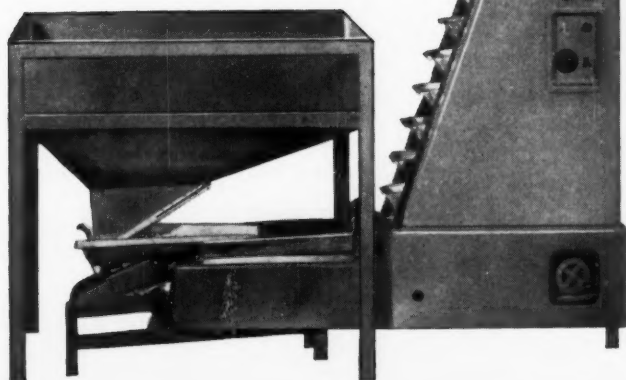
Manufacturing engineers of automatic processing equipment for the glass, packaging, and other industries.

**ATLANTA • CHICAGO
SAN FRANCISCO
ENGLEWOOD, NEW JERSEY**



**LYNCH
CORPORATION**

Anderson, Indiana, U.S.A.



NEWS ROUNDUP

ard Muther, secretary, and Samuel H. Isaacs, treasurer. APMHC was started two years ago by a dozen consultants, either original founders or former officers of the American Material Handling Society. Each was picked for his contributions to the handling industry. APMHC meetings are concerned with exchange of ideas and methods, promotion of standardization, and discussions of ethics. For more information, write Footlik at 9116 Four Winds Way, Skokie, Illinois.

All-cargo schedule for United

UNITED AIR LINES has a full fleet of 13 Cargo-liners serving 16 commercial centers. The line recently replaced seven DC-6As with six high-speed DC-7As. The new ships hold 32,500 lb., compared with 30,000 lb. for the older ones. Revised schedules: outbound lift of 157,500 lb. from New York area; 95,000 lb. from San Francisco; 65,000 lb. from Los Angeles, and from Chicago, 217,500 lb. eastbound and 157,500 lb. westbound.

Lumber mill uses Payloggers



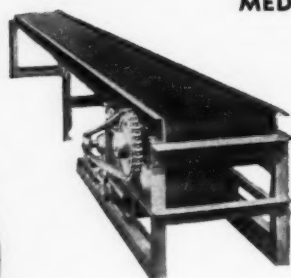
Two FRANK G. HOUGH Co. Payloggers enable the Cal-Ida Lumber Co., Camptonville, Calif., to handle 50,000 board feet of small timber each 8-hour shift. One feeds a mill and the other rearranges logs in stockpiles. The Payloggers come with Drott grapples.

Scott appeals anti-trust decision

SCOTT PAPER CO. announces it will take to court a Federal Trade Commission decision that the firm divest itself of three acquisitions. They are the Soundview Pulp Co., Hollingsworth and Whitney Co., and Detroit Sulphite Pulp and Paper Co., acquired in 1951 and 1954

Continued on page 26

More Speed
... More Space
with Economical
ULTIMATE
Horizontal Roller
Bed Belt
Conveyors



MEDIUM DUTY ROLLER BED UNIT

showing the simple and perfectly engineered Idler and Power Unit arrangement wherein perfect belt tension is obtained quickly. A most efficient straightaway conveyor. Also available on inclined units. Belt widths from 8" to 36" in 2" increments.

MEDIUM DUTY LIVE ROLLER UNIT



with "Package" Power unit attached. Demanding less horsepower, the floating action rollers increase belt and bearing life.

Widths from 8" to 36".

Mail coupon for detailed information.

ISLAND EQUIPMENT CORP. Dept. MH-4
P.O. Box 380276 • Miami 38, Florida

Please send information on the following:

- ☐ Roller Bed ☐ Live Roller
☐ Other Conveyors—Please list

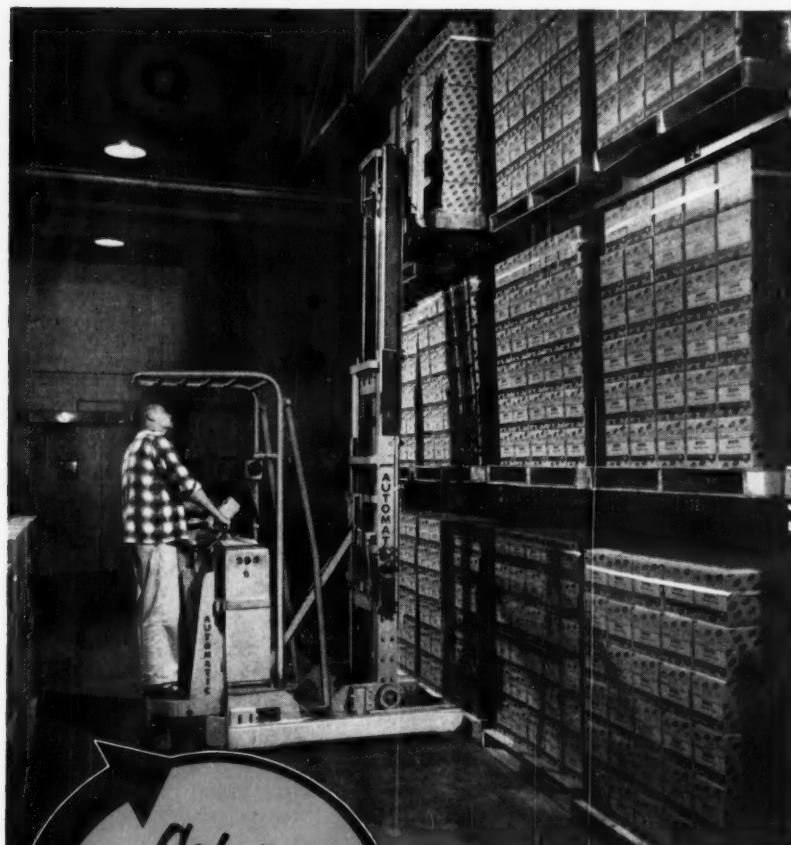
Company

By

Address

City State

Serving Industry 20th Year
Circle 64 on Reader Service Card

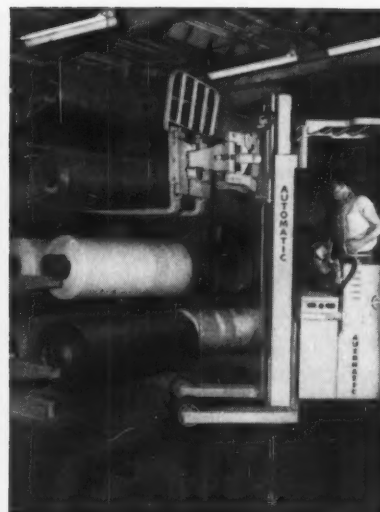


*Got a
narrow aisle
problem?*

Look at all
the ways
AUTOMATIC[®]
can help you
solve it...

Pictured here are three of the over 20 truck models which AUTOMATIC has designed specifically for narrow aisle use. The Model ESRT reach truck shown above, for example, makes it possible to use space-saving narrow aisle layouts without obsoleting your present racks or pallets. The truck can be used with any skid or pallet installation. Eliminates space between loads which is required by outrigger trucks. Instead, the entire mast moves forward to position the forks under the load. Capacities 2,000 thru 4,000 lbs.

Get the details. Mail coupon today.



Transveyer Model ESRF projects forks forward to load and swings forks in unison, right or left of center up to 30°. Since base arms never enter rack, truck can be used with any installation. Capacities 2,000 lbs. through 4,000 lbs.



Six-foot aisles are no problem for this Model ESST-M Transveyer Stacker. Straddle arm design permits it to work in close quarters; its light weight and distribution of load makes it useful for operating in elevators, and on floors with load limitations. Capacities 2,000 through 4,000 lbs.



AUTOMATIC TRANSPORTATION COMPANY
Division of The Yale & Towne Manufacturing Company
141 West 87th Street, Dept. D1, Chicago 20, Ill.

FIRST IN IMAGINATION

FIRST WITH REALITY

—SEND FOR DESCRIPTIVE LITERATURE—

Write for brochure "Narrow versus Wide Aisles" and for "AUTOMATIC Industrial Trucks Selector Guide."

Name _____

Company _____

Street _____

City _____

Zone _____

State _____



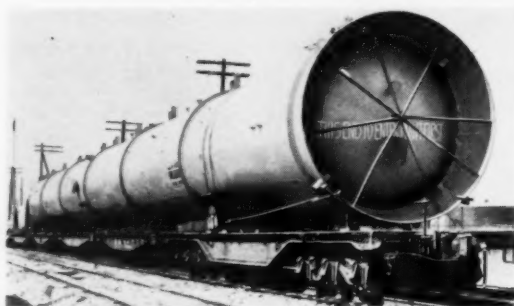
Circle 6 on Reader Service Card

NEWS ROUNDUP

through merger and acquisition. Scott contends that none of the three was in competition with Scott when acquired. Scott points out that the FTC hearing examiner twice ordered the complaint dismissed, but it was not.

A vessel on four rail cars

DELTA TANK MANUFACTURING CO. aims this towering pressure vessel in the right direction as it leaves the Baton Rouge, La., plant. The

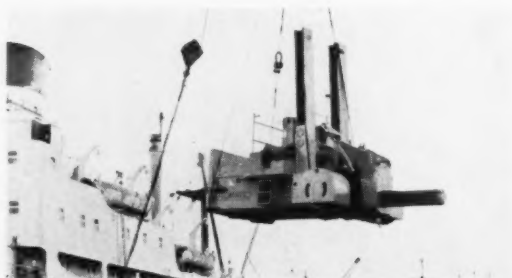


vessel, a propylene fractionator, also is marked "This end to enter plant first." The vessel,

bound for Lake Charles, La., weighs 456,700 lb., is 194 ft long. It's carried on four rail cars, with its base on a fifth car.

Giant ram truck for export

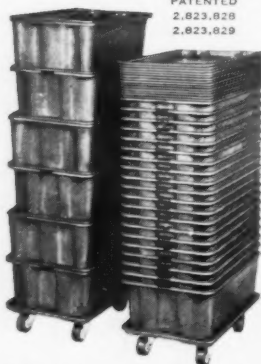
AUTOMATIC TRANSPORTATION Co. shipped this \$100,000 ram truck to Britain's largest



steel producer, The Steel Co. of Wales Ltd. Without battery or counterweights, it weighed 77,000 lb. It will lift 70,000-lb. coils of steel, place them 117 inches off the ground. Automatic already has shipped 32 other ram trucks of varying sizes to the British firm. Stuart Nelson, Automatic's export sales director, says 1961 exports will equal about two months of total production from this Chicago manufacturer.

Lewis Containers

SOLVE EVERY HANDLING PROBLEM



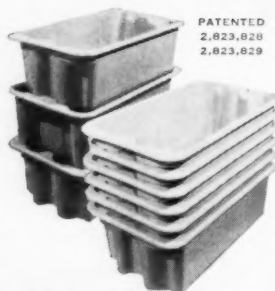
PATENTED
2,823,828
2,823,829

Stack-n-Nest® TOTE PANS

Only Lewis Stack-n-Nest tote pans stack and nest, within their own dimension, without any mechanical gadgets. Molded in one piece of Fiberglass reinforced polyester... can't dent, rust, rot or warp. Available in 8 sizes from 16"x10"x5" to 34"x24"x19", in grey, green, and red. Accessories include pan covers and 4-caster dollies. Shipment within 24 hours from receipt of order.

PLASTIBOX UNITIZED ASSEMBLY CONTAINERS

One piece, molded plastic. Strong, smooth, non-corrosive, easily cleaned. Stack securely and afford maximum storage of parts; 4 sizes in green or yellow. Accessories are available for a wide variety of bench or wall mounting. Truck assembly allows boxes to be quickly moved. Shipment within 24 hours from receipt of order.



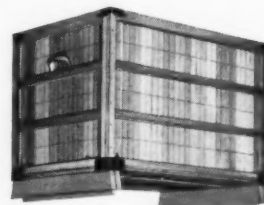
PATENTED
2,823,828
2,823,829

PolyLewton FOOD HANDLING PANS

Stack-n-Nest pans are available in this remarkable material developed for raw food handling. The glass-like surfaces are easily cleaned, have no crevices to harbor bacteria. Inside dimensions are 20"x12"x8", weigh 3 3/4 lbs., handle up to 50 lbs. Shipment within 24 hours from receipt of order.

WOVEN WOOD-AND-WIRE HANDLING CONTAINERS

Tough, resilient wood-and-wire webbing is combined with a select hardwood frame, jointed at corners and reinforced with steel corner irons... here are husky, long-lived, big capacity containers available in many sizes and styles, including trucks and collapsible boxes. Designed for single or multiple handling with modern handling systems and equipment. One to three week delivery.



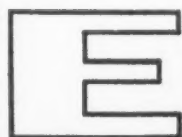
WRITE TODAY
for illustrated brochures on the
complete Lewis material handling
container line.

G.B. **Lewis** COMPANY

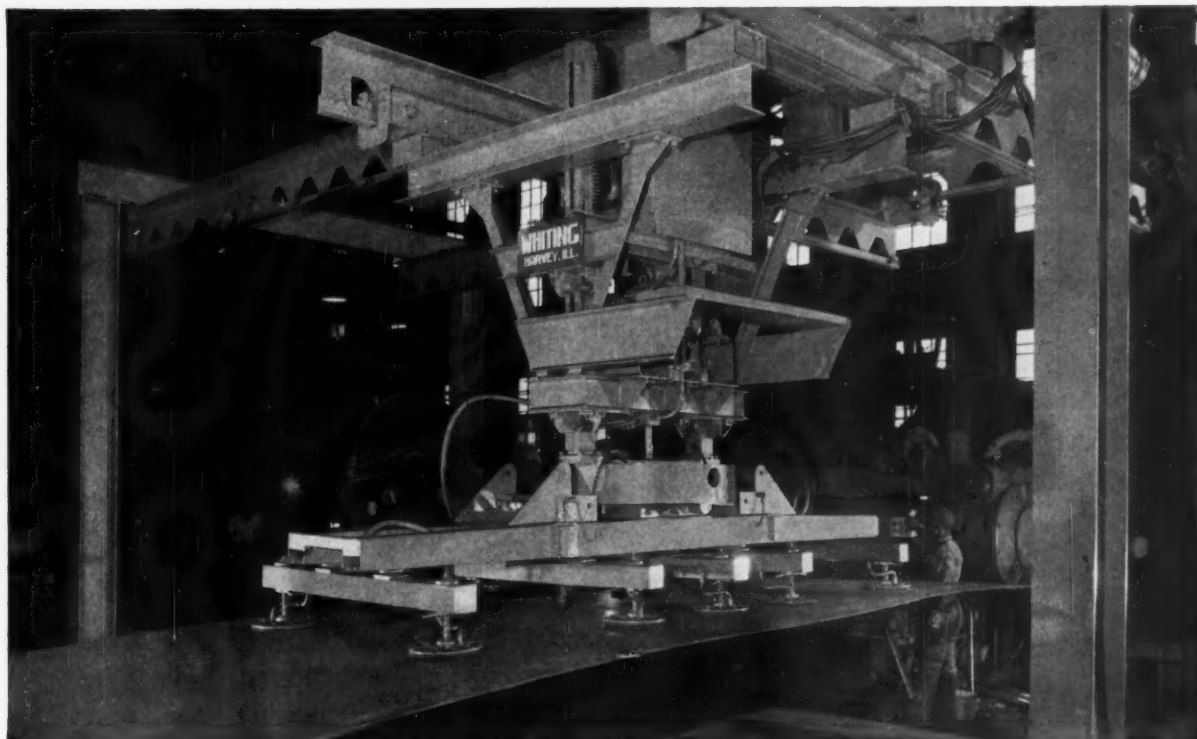
604 Montgomery Street, Watertown, Wisconsin

Circle 68 on Reader Service Card

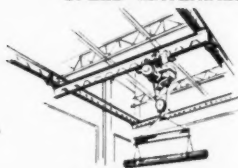
MATERIAL HANDLING ENGINEERING



**HELPED PULLMAN-STANDARD
SOLVE A WEIGHTY PROBLEM
BY USING TRAMBEAM®**



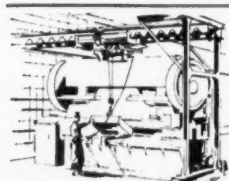
**VERSATILE TRAMBEAM CAN
SPEED MATERIALS HANDLING FOR YOU**



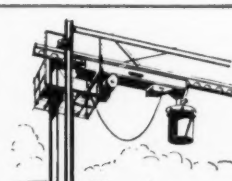
TRAMBEAM CRANES



TRAMBEAM MONORAIL SYSTEMS



TRAMBEAM GANTRY CRANES



SPECIAL APPLICATIONS

Feeding heavy steel plate into a shear was tough, tedious work at Pullman-Standard. Men were hard to get for the job and twice as hard to keep. Pullman called on Whiting engineers to discuss the problem.

Now Whiting Trambeam combined with Whiting Pressuregrip uses vacuum to move steel plate into the shear automatically.

Your plant can step up production and cut costs by speeding up in-process material handling with Trambeam. We'd like to tell you how.

Want details on Trambeam?
Ask for bulletin M-34
15659 Lathrop Ave., Harvey, Illinois



WHITING TRAMBEAM OVERHEAD MATERIAL HANDLING SYSTEMS

See our catalog in Sweets

90 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS



WHITING

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; PRESSUREGRIP; TRACKMOBILES; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL PROCESSING EQUIPMENT

Circle 133 on Reader Service Card

April, 1961

27

Allis-Chalmers lift trucks mechanical hands for your favorite brands

The F-40: first of a new series with POWER-CRATER engines that means more power with less fuel. Write now for free catalog.

Many of the most famous brand-name products of American industry are helped on their way to market on the forks, clamps, hooks and scoops of Allis-Chalmers multi-purpose lift trucks. They provide vital help in cutting critical handling

costs . . . move material fast, lift it high, stack it carefully. And they're only part of the wide range of Allis-Chalmers material-handling equipment . . . including tractors, loaders, blowers and pumps. Allis-Chalmers, Milwaukee 1, Wisconsin.

POWER-CRATER is an Allis-Chalmers trademark.

ALLIS-CHALMERS



POWER FOR A GROWING WORLD

Circle 4 on Reader Service Card

MATERIAL HANDLING ENGINEERING

When . . . Where . . .

MHI Eastern State Show
 THE MATERIAL HANDLING INSTITUTE's Eastern States Show fourth in a series of regional shows, opens May 9 and will run until May 11. The place: Philadelphia's Trade and Convention Center.

Show Hours

Show hours on May 9 are from 11 to 6; on May 10, 11 to 9; and May 11, from 11 to 4.

Theme

"The Continued Challenge of Material Handling" is the theme of the technical conferences staged by AMHS Region II.

Technical Conferences

Sessions will be held at the Convention Center on each of the three mornings from 9 to noon. Two separate meetings are set for May 9 and 11; three separate meetings for May 10. Robert B. McKee, project engineer, Sun Oil Company, Philadelphia, is general conference chairman. Co-chairman is William J. Scott, Vick Chemical Co. Program chairman is Herbert J. Neubert, Schering Corp.

Conference Fees

Registration fee is \$25 for the three days; \$10 for one day. Sponsors are the five AMHS Region II chapters. Fees cover the conferences, there is no charge for the show. For advance registration or more details, contact Robert B. Woolery, Registration Chairman, P. O. Box 9562, Frankford Station, Philadelphia 24, Pa.

The Idea Center

This is a repeat from The San Francisco show. Over 3,000 captioned photographs are mounted on large display boards. Each picture presents an MH or protective packaging product to solve specific problems in 15 separate industry classifications. Each product is modified from standard design. Pictures are keyed to the industry served and to exhibitor booth number.



WILLIAM J. SCOTT
 General Conference
 Co-chairman



ROBERT B. MCKEE
 General Conference
 Chairman



HERBERT J. NEUBERT
 Program Chairman

TECHNICAL SESSIONS

Tuesday, May 9

Room A

9-10:30

Automation in Distribution
 Richard L. Speaker, President,
 Speaker Sortation Systems, Inc.

10:30-Noon

Containerization
 C. W. Bent, Product Manager,
 Container Handling Devices,
 Clark Equipment Company

Room B

9-10:30

Incentives in Material Handling
 A. Booth, Albert Raymond Associates

10:30-Noon

Safety in Material Handling
 William Renner, Safety Director,
 Shering Corporation

Wednesday, May 10

Room A

9-10:30

Work Simplification
 H. Schreiber, Jr., Professor,
 School of Industrial Management, MIT

10:30-Noon

Proper Plant Layout and Design
 James M. Apple, Vice President
 of Manufacturing,
 Clarke Floor Machine Company

Room B

9-10:30

Selection, Training, Developing,
 and Evaluating MH Personnel
 G. P. Frost, McKesson & Robbins, Inc.

10:30-Noon

Labor and Material Handling
 George Baldzani, International President,
 United Textile Workers of America,
 AFL-CIO

Room C

9-10:30

Automation in Order Filing and
 Warehousing
 C. E. Viscione, Project Engineer,
 Colgate-Palmolive Company

Thursday, May 11

Room A

9-10:30

Centralized vs. Decentralized
 Warehousing and Distribution
 Walter F. Friedman, Vice President,
 Dasol Corporation

10:30-Noon

Unit Loads
 Irving M. Footlik, President,
 Irving M. Footlik & Associates

Room B

9-10:30

Material Handling In Transportation
 A. W. Greene, Editor,
 Distribution Age

10:30-Noon

Intra-Plant Material Handling
 J. Wellington Hall,
 Meter Division,
 Westinghouse Electric Corporation

look!..isn't this American rack installation a beauty?

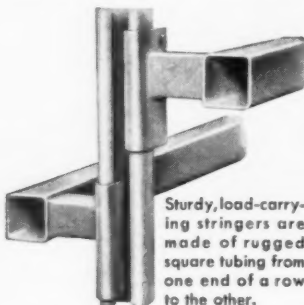


American Rack installation at the Fleming Company, Topeka, Kansas. On left are open-end, drive-in racks, and on right are selective-type racks.

American
adjustable
STORAGE RACKS

are tough and rugged . . . designed to meet your storage problem most efficiently and economically!

American Open-End drive-in type racks
make aisle space storage space . . . ideal for bulk storage



WHATEVER YOU WANT in storage racks, American's got it! . . . **SOLID CONSTRUCTION**—posts are specially roll-formed of extra heavy gage steel—stringers are one-piece continuous welded steel tubing—upright frames are cross-braced against sway—turnbuckles "level out" uneven floors . . . **QUICK ASSEMBLY**—all parts hook into place—no costly bolting . . . **EASY ADJUSTABILITY**—stringers work independently of any other part—they raise and lower like a window, on 4" centers . . . **TOP EFFICIENCY**—American racks utilize every inch of storage space—they save you time, labor and money from the very start of installation—they provide industry's highest safety factor for utmost protection.

send for catalog

AMERICAN METAL PRODUCTS COMPANY
STORAGE RACK DIVISION

5961 Linsdale Ave. **amp**® Detroit 4, Michigan

Manufactured in Canada by Sunshine-Waterloo Co., Ltd., Waterloo, Ontario

Circle 7 on Reader Service Card

American Slide-n-Lock selective type racks
for all types of merchandise—whether light packages or heavy metal products.

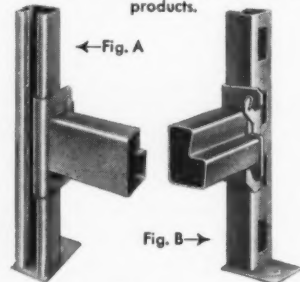
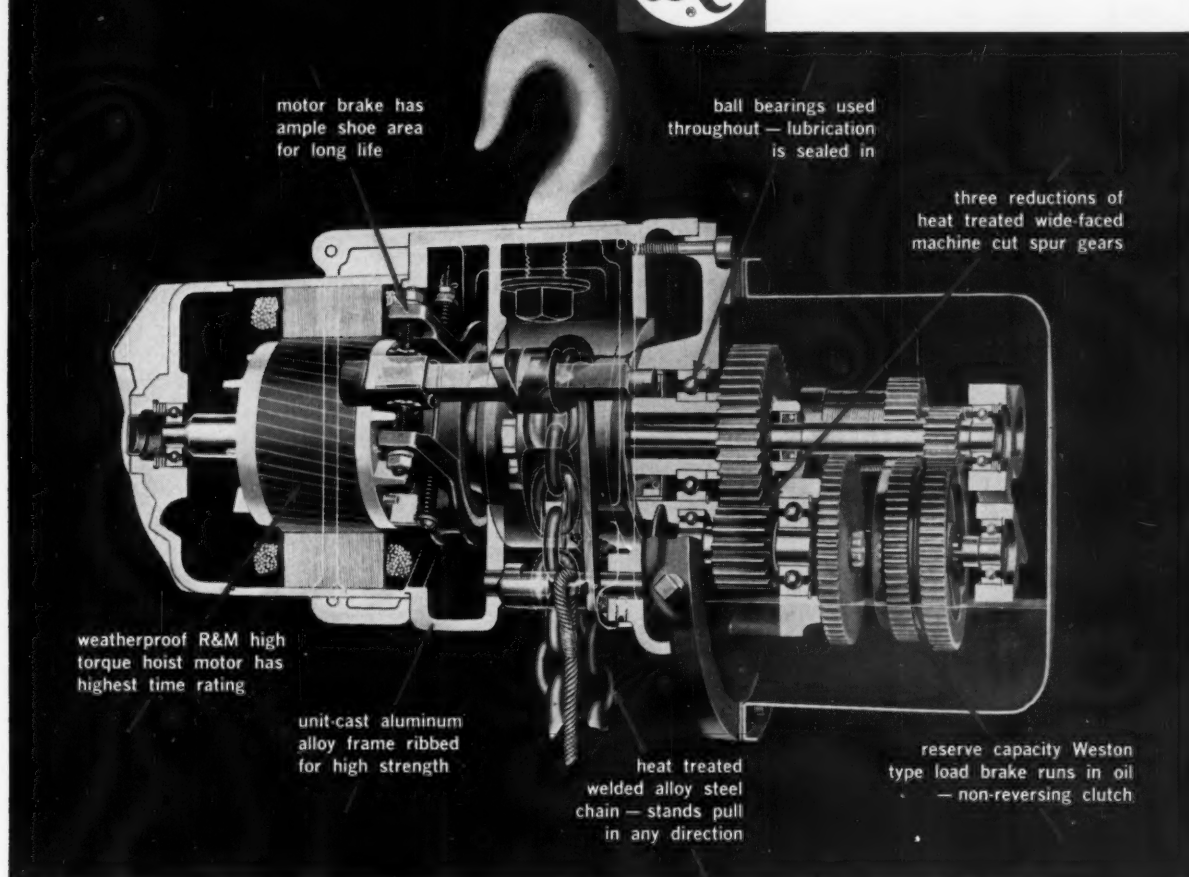


Fig. A—smooth line construction of aisle side of post and stringer eliminates hazardous protrusions. Fig. B—note rigid connection when stringer is "locked" to post.



HOISTS/CRANES



HOIST RUGGEDNESS AT ITS BEST

Robbins & Myers Type JC chain hoists are the kind you need for heavy service over bruising loads. At prices fully competitive, they incorporate extra-husky features that withstand continual punishment. Here are some of the points of superiority that can go to work for you: R&M high-torque hoist motor has the highest time rating found in any hoist—30 min., 55° C. Weatherproof construction locks out moisture. Two brakes guard the load—a Weston type load brake has reserve capacity and a shoe type motor brake lets you spot loads cleanly and accurately. Sealed, weatherproof controls operate by rope. Type JC hoists are stocked near you for immediate delivery. Features and options: portable, 10 foot lift, hook mounting or push trolley, capacities — 500, 1000, and 2000 lbs. Request Bulletin 852-B from the Hoist & Crane Division, Robbins & Myers, Inc., Springfield, Ohio or Brantford, Ontario.



ROBBINS & MYERS

hoists & cranes, Moyno® pumps, motors, Propellair® fans
Circle 100 on Reader Service Card



COST CUTTING IDEAS

Storage Space Increased 33%



The Blocklite Company, Selma, Calif. increased finished product storage space by a third without adding property.

They did it by expanding outside storage space upward. Method: using fork trucks equipped with high-stacking uprights.

Blocklite makes lightweight and heavyweight concrete blocks in 350 different sizes, shapes, and colors. They store the inventory on the extremities of a narrow 63,870 sq.

ft. plant. They manufacture and ship from the center area, a fair distance from storage.

Plant operations require fork trucks to make continual trips from manufacturing to inventory and back to shipping. They handle 125 tons of concrete blocks in 8 hours.

The trucks can stack as high as 14' 2" yet operate where headroom is limited to 7' 3". Trucks are fitted with 6-tine block forks. They move to the left or right of the truck

center by hydraulic side shifter attachments.

Blocklite Company says its management can concentrate on production since they rent the fork trucks and depend on the dealer for maintenance service.—Clark Equipment Co.

Circle 250 on Reader Service Card

Expensive Floor Repair Stopped

The Norton Co., Worcester, Mass. makes abrasives. The company figured out it paid \$60,000 in one year for floor surface repairs. And the expense threatened to grow as the company expanded.

Norton had tried various patching materials. They even put steel plates in areas of unusual traffic. But the story never changed. The grains of abrasives spilled on the floor, and the material-handling vehicles ground away the steel with the particles just as they abraded regular concrete.

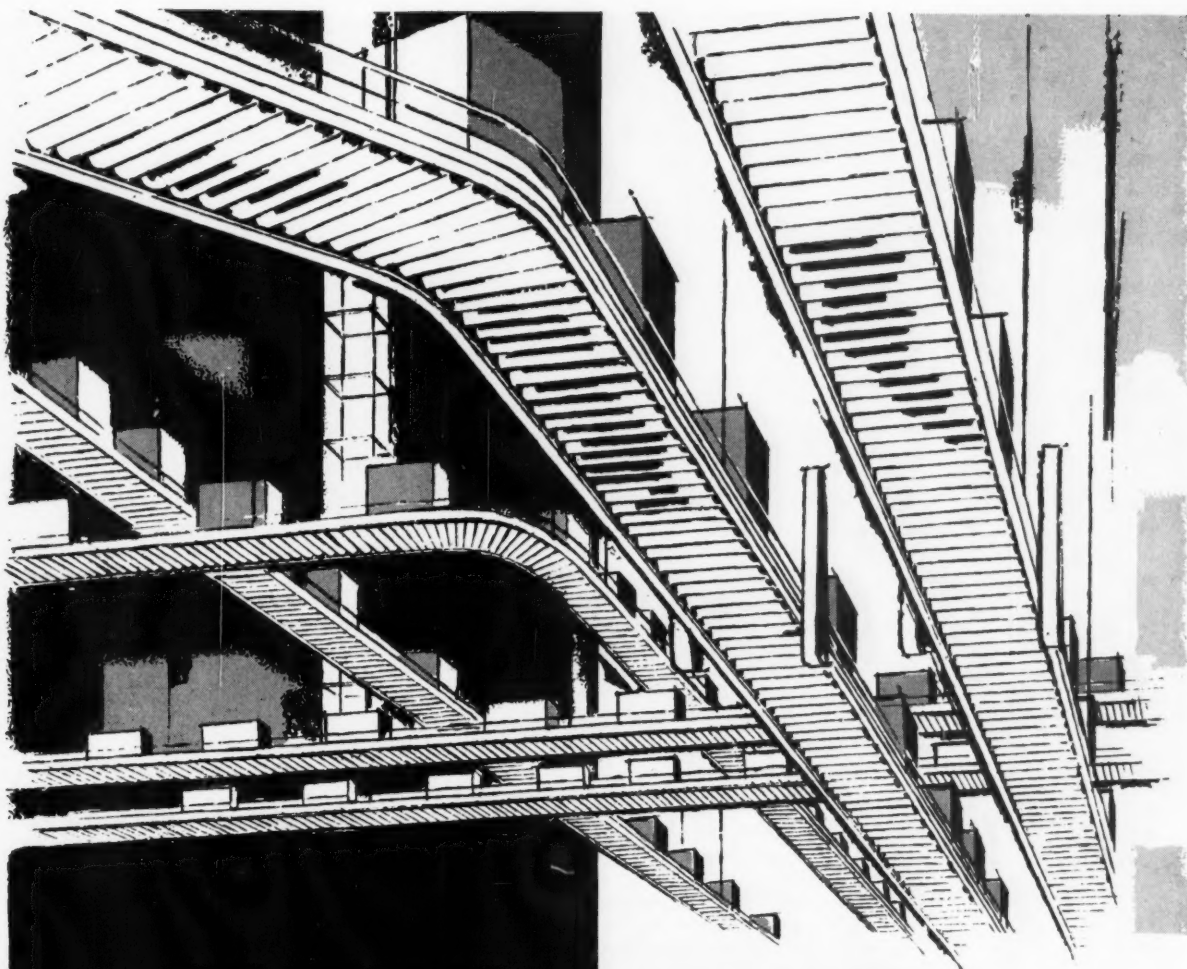
Then they tried a special heavy-duty concrete topping. A contracting firm put it on in a machine shop; a grinding wheel plant; an abrasive supply and storage building; and in the kitchen and serving areas of the plant cafeteria.

This topping now is 4 years old. It cannot yet be called an unquali-



fied success. That, according to Norton, can't be done until the

Continued on page 34



NIGHT and DAY

ALVEY Conveyor Systems Help Reduce Your Operating Cost

Like power failures, fires, or faulty machine tools, an inefficient handling system builds your cost—tears down your profit.

Alvey engineers have designed many ingenious, tested ideas to make package handling more automatic—and less expensive. Alvey customers have discovered that a properly-designed conveyor system often gives you

30% to 50% more output per shift—in *the same plant*. When necessary, Alvey systems operate on 2 or 3 shifts. If you want smooth, night-and-day production in your plant, call Alvey. No charge for consultation, of course.

Successful Material Handling Systems are Automatic With Alvey.

ALVEY CONVEYOR MANUFACTURING COMPANY

9299 OLIVE STREET ROAD, ST. LOUIS 32, MISSOURI • Branch Offices in Principal Cities

ALVEY ENGINEERING PAYS OFF... *for customers like these:*

Gaylord Container
General Foods

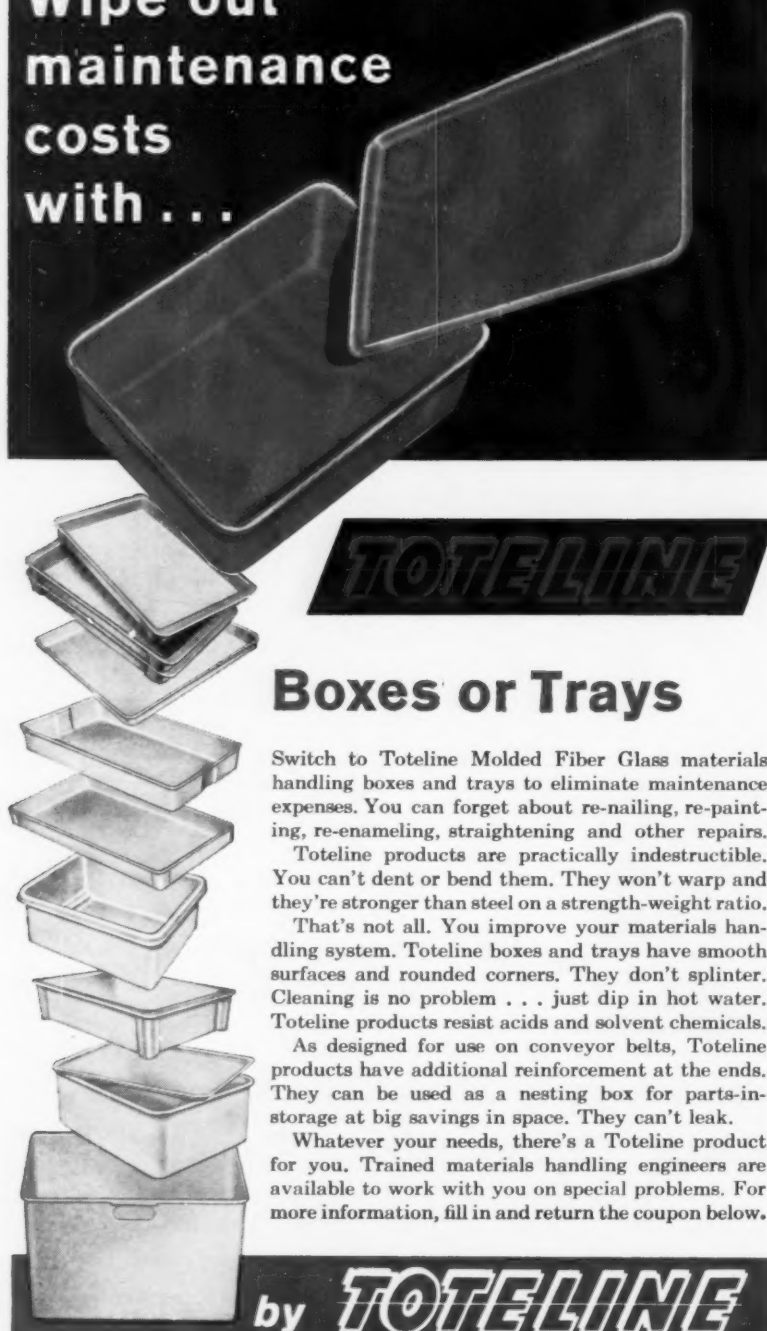
Monsanto Chemical
Pet Milk

Ralston Purina
Schenley Distillers

Standard Oil
Springs Cotton Mills

Circle No. 5 on Reader Service Card

**Wipe out
maintenance
costs
with ...**



Boxes or Trays

Switch to Toteline Molded Fiber Glass materials handling boxes and trays to eliminate maintenance expenses. You can forget about re-nailing, re-painting, re-enameling, straightening and other repairs.

Toteline products are practically indestructible. You can't dent or bend them. They won't warp and they're stronger than steel on a strength-weight ratio.

That's not all. You improve your materials handling system. Toteline boxes and trays have smooth surfaces and rounded corners. They don't splinter. Cleaning is no problem . . . just dip in hot water. Toteline products resist acids and solvent chemicals.

As designed for use on conveyor belts, Toteline products have additional reinforcement at the ends. They can be used as a nesting box for parts-in-storage at big savings in space. They can't leak.

Whatever your needs, there's a Toteline product for you. Trained materials handling engineers are available to work with you on special problems. For more information, fill in and return the coupon below.

by **TOTELINE**

MOLDED FIBER GLASS TRAY CO., LINESVILLE, PA.

One of the Molded Fiber Glass Companies

World's Largest Producer of Reinforced Plastic Trays and Tote Boxes

We are interested in how Toteline Molded Fiber Glass reinforced boxes and trays can eliminate maintenance expense while improving materials handling. Please send further information.

Briefly, here is how we use parts handling boxes or trays _____

Name _____ Title _____

Company _____

Address _____

MF4-MHE

Circle 76 on Reader Service Card

COST CUTTING IDEAS

floors have been in for 15 or 20 years, the minimum average life for this floor surface. But so far they show no wear whatsoever. Other 3-year-old floors had showed deterioration signs, and some had required repair.

Quoting Frank Burgoyne, Nortons' chief layout and construction engineer, "I find there's a decided advantage in having specialist tradesmen finish a floor. An amateur doesn't have the workmen or the knowledge to lay on good floor except by luck."

The machine shop (illustration) has a granolithic concrete topping which withstands heavy loads.—*Kalman Floor Co.*

Circle 251 on Reader Service Card

Seed Firm Cuts Packaging Costs 56%

Ferry-Morse Seed Co., Mountain View, Calif. packages many of its 1,572 varieties of seeds in extensible paper bags. They formerly used cotton and burlap sacks.

The trend, they say, is toward smaller bags for greater ease in



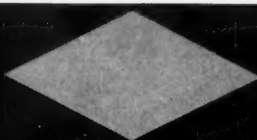
handling, customer convenience, and faster order filling.

The most popular sizes are 25- and 50-lb. bags. Moisture protection, of course, is an important consideration in the seed industry, and Ferry-Morse is satisfied with the high degree of protection offered by the new bags with the polyethylene lamination.

The most-used bag holds 25 lb. of seed, measures 12" x 3" x 26½". It has three plies of 50-lb. basis-

Continued on page 38

MATERIAL HANDLING ENGINEERING



DIAMOND roller chains

*specified for P. I. Steel's elevated
"JETWAYS"*



P. I. Steel Corporation, Division of Stan-ray, specified DIAMOND Roller Chain for three drive mechanisms in their new "JET-WAY" telescopic loading bridges, shown above in use at United's San Francisco facility.

P. I. Steel, like most leading manufacturers of chain-driven equipment, selected DIAMOND for its proven strength, dependability and long, trouble-free service.

To solve problems of load, shock and fatigue; to insure reliable, low-cost power transfer . . . specify DIAMOND whenever you use roller chain.

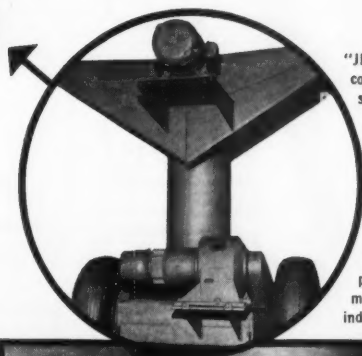
Write for the new DIAMOND Roller Chain and Sprocket Catalog No. 760. Engineering service is available from the factory or through Distributors in all principal cities.

DIAMOND CHAIN COMPANY, INC.

A Subsidiary of American Steel Foundries

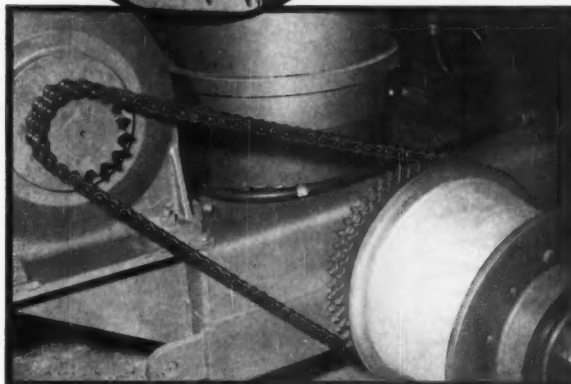
Dept. No. 624 • 402 Kentucky Avenue
Indianapolis 7, Indiana

Look under "Chains" or "Chains, Roller" in the Yellow Pages for your nearest DIAMOND Distributor



"JETWAY" mechanical drive unit consists of a telescoping column supported by two independent, motor-driven wheels. Three electric motors with DIAMOND roller chain drives are employed in each unit.

Two DIAMOND double-strand roller chains transmit power to wheels (one shown below with tire removed) and one transmits power to the raising and lowering mechanism. Wheels are propelled independently for steering purposes.



DIAMOND



ROLLER CHAINS

®

new
RAYMOND
truck fills a

TALL
ORDER



RAYMOND Heavy-Duty Reach-Fork® (1) works inside boxcars; (2) tiers 20 feet or higher; (3) operates in aisles as narrow as 7 feet; (4) utilizes your existing racks and pallets; (5) increases warehouse capacity up to 50%; (6) performs continuously at fast speeds with full loads, on long ramps, indoors or out!

This is an unusual truck. Not a "beefed-up" model, but rather a brand-new unit, designed and built expressly to handle heavy-capacity loads. With RAYMOND's new Three Stage Mast, it will stack loads clear to the ceiling...yet operate with equal ease inside boxcars or truck trailers. Powered by our rugged new "900" tractor, the RAYMOND Heavy-Duty Reach-Fork features larger tires and heavier components throughout. It provides performance comparable to counterweight trucks of the same ca-

capacity...plus continuous operation hour after hour, day after day, with a minimum of maintenance.

Like all RAYMOND Trucks, the new Heavy-Duty Reach-Fork offers an important advantage over counterweight units: It operates in narrowest aisles (as little as 7 feet!)...freeing valuable areas of warehouse space for additional storage. Moreover, RAYMOND's famous "Boarding House Reach" enables it to work with the racks and pallets in use in your warehouse right now.



Originator and World's Largest Builder of Narrow Aisle Trucks

FULL DETAILS on the new Heavy-Duty Reach-Fork will be found in our latest Bulletin. WRITE FOR IT TODAY.

The RAYMOND CORPORATION

3333 Madison St., Greene, N.Y.

Please send bulletin on new

Heavy-Duty RAYMOND Reach-Fork

NAME

COMPANY

STREET

CITY

TITLE

STATE

See this truck at Booth 449

MHI Eastern States Show

Philadelphia—May 9, 10 & 11

Circle 98 on Reader Service Card





SELF-PROPELLED K-4 removes traffic-packed dirt in 1 operation. Operator merely guides it.

removes 2 tons of incrustated grime in less than 8 hours

New self-propelling TENNANT Model K-4 Floor Machine shears off and picks up hard-packed layers of grease-caked dirt in one operation. Lets one man do a faster, cleaner job than a 6-man crew with hand scrapers!

Machine does all the work—you simply guide it. Propels itself forward... reverses instantly at touch of a lever. Propels itself back over pulverized path for extra-clean "whisk-broom" type pick-up. *Easier than ever to use.*

Has many new features—30% larger envelope-type, vacuumized filter (over hopper) for better dust control... new longer-wearing wire brush... 28% more powerful engine—plus many other cost-saving features.

Terrific cleaning power—Can remove over 2 tons of traffic-packed dirt per shift... shears off tough build-up other methods can't touch. 1725 rpm tool cleans a 16" path lightning fast. No hand-scraping, no chemicals, soap

or water. Leaves floor clean, dry and hump-free, ready for immediate, faster traffic. *Before-and-after photos below are graphic proof of dramatic results.*



BEFORE—Heavy grease-caked grime on wood block floor in busy aisle "drags" at truck wheels... slows traffic to a crawl.

AFTER—High-speed K-4 instantly pulverizes and picks up tough, heavy dirt... cleans right down to floor surface.

WRITE TODAY for illustrated bulletin, photos and performance data. G. H. Tennant Co., 707D No. Lilac Drive Minneapolis 22, Minnesota.



**HEAVY-DUTY
FLOOR
MACHINES**

SPECIALIZED MAINTENANCE EQUIPMENT

POWER SWEEPERS • FLOOR MACHINES • SCARIFIERS • ROOF SCRAPERS • CONCRETE ROUTERS

Circle 125 on Reader Service Card

COST CUTTING IDEAS

weight extensible kraft. The outer ply is of bleached (white) stock. It's printed in three colors, and has an appealing appearance. They coat the outer ply with a 10-lb. layer of polyethylene for moisture protection.

The extensible paper looks like regular kraft paper, but it has been compressed and compacted in its manufacturing process. This makes it capable of stretching and withstanding impacts.—Clupak, Inc.

Circle 252 on Reader Service Card

Waste Acid System Proves Economical

The Timken Roller Bearing Company is alert to waste disposal at all of its plants. Its Wooster, Ohio plant recently found a way of getting rid of waste acid without polluting water supply or saturating the soil.

The Wooster plant uses pickling acid (a 10 percent solution of sulfuric acid heated to 150°F.) to remove scale and rust from steel tubes.

When the acid content falls to 7 percent, the plant removes the weakened solution.

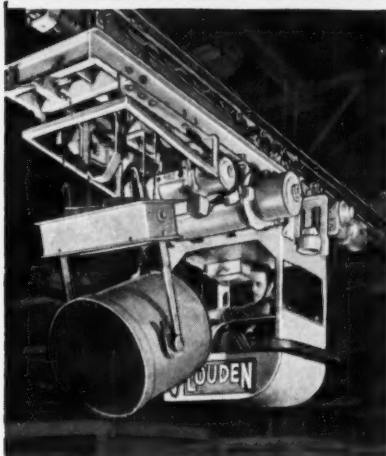
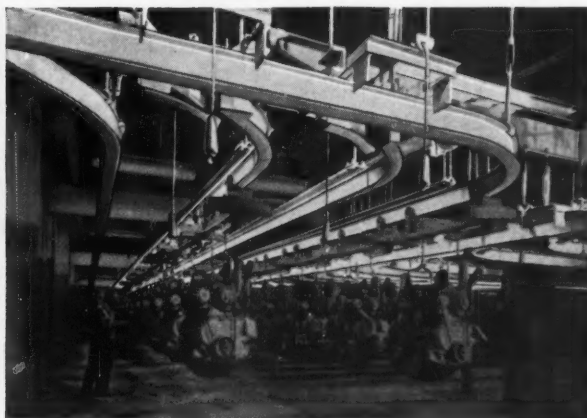
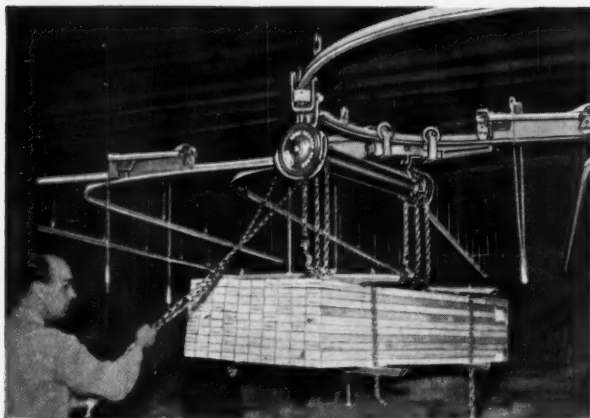
To save the soil from saturation, Timken devised a special



method. It built a brick-lined storage pit outside the pickle building. The waste pickling acid is pumped through pipes into the pit by an electric acid pump. When enough waste acid is accumulated, it's pumped into a company-owned truck and hauled to the company's

Continued on page 40

MATERIAL HANDLING ENGINEERING



Cab controlled "shuttle carrier" travels via monorail throughout large metal fabricating plant. Monorail carriers make possible close grouping of production machines because space travel of materials clears aisles for production.

Hand chain twin hook hoist transports stock from storage to processing. This low cost monorail system permits maximum use of plant floor ... wide aisles are not needed since bulky loads of lumber run travel above fabricating equipment.

Louden Monorail Handling System provides live storage for leading tractor manufacturer. Here engines are received, stored and transferred to test line on smooth running Louden trolleys, all without rehandling.

Leading producer of glassware reduced cost of mold maintenance with monorail system and chemical method of cleaning. Molds are loaded on pallets and automatically travel through the cleaning cycle, stopping and dipping molds into chemicals.



UNTANGLE PLANT TRAFFIC WITH MONORAIL

Clear the aisles for production ... use monorail for materials handling. Suspended from the ceiling, a Louden Monorail Handling System removes traffic from the floor, saves floors for production. Not only does this untangle plant traffic, but also increases plant capacity and becomes a big factor in cutting cost of floor maintenance.

A Louden Monorail Handling System moves raw stock, semi-finished and finished products over the heads of men and machines, and its exceptional flexibility makes it ideal for all types of handling requirements. It can transport materials from point

to point anywhere in your plant, either piloted by an operator or completely unattended. Materials can travel from floor to floor, building to building, opening and closing doors, pass through one processing stage after another, and even load and unload its own carriers with certain classes of materials.

When you have material handling requirements, call on Louden, the pioneer of monorail handling. Benefit by Louden's unequalled experience and broad array of service-proven equipment. Most Louden installations pay for themselves in months; some have done so in a matter of weeks.

Louden

MONORAIL & CRANES



NEW ... 52 pages of illustrated applications ... industry by industry. Get the latest and most complete information on planning and equipment selection for the best in modern materials handling. Write today for your copy "COST-CUTTING WITH MONORAIL AND CRANES."

THE LOUDEN MACHINERY COMPANY

413 Broadway, Fairfield, Iowa
A Subsidiary of Mechanical Handling Systems Inc.

SINCE 1867 ... THE FIRST NAME IN MATERIALS HANDLING

Circle 71 on Reader Service Card

COST CUTTING IDEAS

acid neutralizing plant at its Canton, Ohio steel mill, 30 miles away.

Each day, the tank truck hauls at least one load. Every other day it makes two trips.

Says Timken: "This system has provided a much more economical means of removing waste acid than

we would have by building a special neutralizing plant at Wooster."
—The Timken Roller Bearing Co.

Circle 253 on Reader Service Card

Cargo Control System Speeds Loading

A contract hauler for the National Gypsum Co. speeds loading and increases safety by using ratchet buckle assemblies to secure loads of plaster board on flatbed trailers.

The driver says that it's fast and easy to secure the load. Retensioning along the way is very simple, even in wet, or freezing weather. You can tension the buckle with one hand in seconds. The strap end simply hooks onto the trailer bed.

The hauler says that after many months use, the assembly straps show no wear. Only eight assem-



blies are necessary. You can use the same idea to tie down roofing, plywood sheets, and similar materials.—General Logistics Div., Aeroquip Corp.

Circle 254 on Reader Service Card

Specify **KEYRACK**



RUGGED, 2-PIECE STORAGE RACK WITH BUILT-IN SAFETY LOCK *

An engineering achievement in storage racks. Now you can easily erect a storage rack in your plant with minimum effort and maximum use of cubic area. Safety locking device automatically snaps into position affording protection against accidental impact by lift trucks or equipment. Just tap into place (see insert) you do not have to touch the lock. Observe the positive locking action! All Keyracks are provided with heavy gauge channel bracing.

OTHER PRODUCTS OF STORACK CORP.

STORACK — A metal bolted framing rack, for the exceptional storage application.

RACKS THAT STACK — Specially designed for coils, bar stock and pipes.

* PATENT APPLIED FOR



STORACK CORPORATION

315 N. ADA STREET

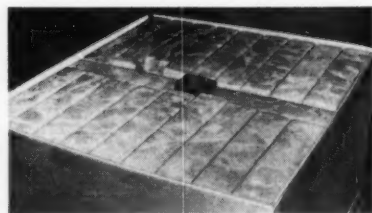
CHICAGO 7, ILL.

Circle 119 on Reader Service Card

Container Cuts Handling Costs

The Rose Packing Co., Inc., Chicago uses a special corrugated bulk shipping container for the company's loaf style boiled ham.

The container holds 800 lb. of



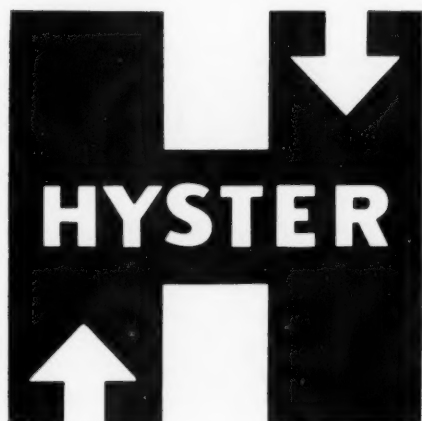
boiled ham. The old boxes used to hold only 50 lb.

Because of the weight, every box must be handled with machines. This reduces damage. Besides protecting the ham, the bulk container reduces material handling costs for Rose and its customers. The light tare weight of the corrugated also saves shipping costs.—Stone Container Corp.

Circle 255 on Reader Service Card

Continued on page 42

MATERIAL HANDLING ENGINEERING



Hyster 2,000 and 2,500 lb. cushion tire lift trucks—industry's newest and finest.



WRITE YOUR OWN TICKET

"American Industry" is a phrase which really means a lot of companies, each with individual requirements for working capital and equipment. This great variety is the reason Hyster's Custom Leasing Plan was created. Now you can virtually write your own ticket for both equipment and financing to meet your material handling needs.

This plan puts the newest and finest lift trucks to work for you on your own terms. You can rent, lease or buy...one truck or a fleet...by the day, week, or month...for one day or five years. You can do your

own maintenance or choose a plan that includes it. You can select any combination of rentals, with or without option to buy.

Financing is equally flexible, and the choices are offered in your own area by your Hyster dealer, who will be pleased to work with you to survey your needs for trucks and attachments. Talk with him soon about Custom Leasing...the plan that makes it easier than ever for you to use the equipment that sets the engineering pace for all lift trucks.

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers

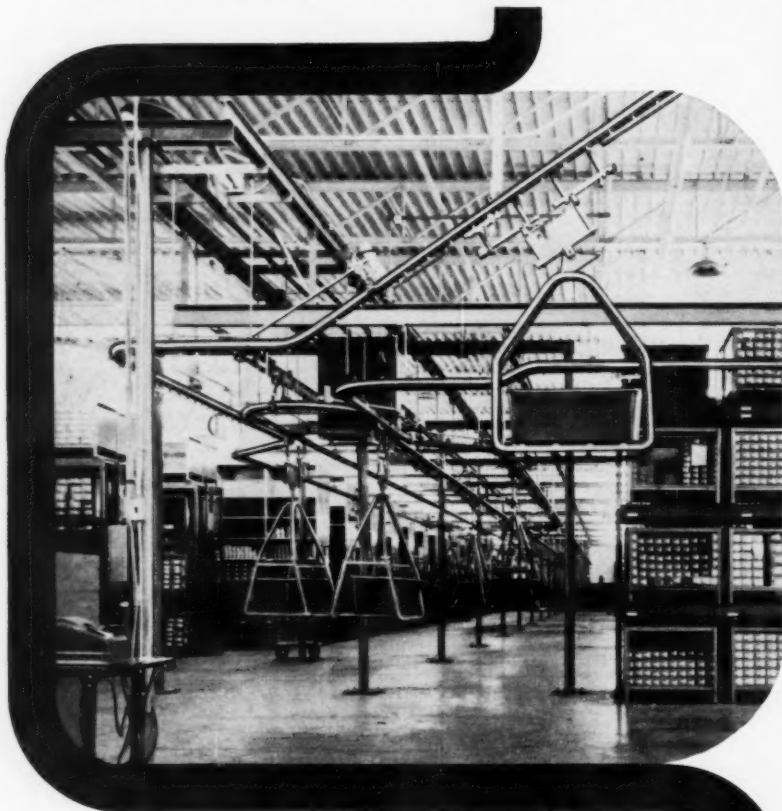
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Manufactured in: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill.
Australia • Brazil • England • France • The Netherlands • Scotland • Union of South Africa

Circle 61 on Reader Service Card



HYSTER COMPANY
HYSTER LEASING DIVISION
P. O. Box 4318 • Portland 8, Oregon

ORDER PICKING SLASHES HANDLING TIME FOR S.P.S.



Standard Pressed Steels' Chainveyor overhead power and free conveyor system smooths work flow and speeds complex order picking. The warehouse dispatcher places an order in an empty carrier on the conveyor and indexes it to route itself to the zones in the warehouse having the stock items needed. Each section stockman selects the items ordered from his zone and then sends the partially loaded carrier to the next required point of service for further completion of the order. The pre-indexed carrier automatically by-passes stations not called for and stops only in the zones where warehoused items are stocked. Completed orders are transported on the conveyor to the shipping department and are automatically released for packing. The empty carriers then return to the dispatching area to repeat the cycle.



For details on the S. P. S. installation, or other low cost Chainveyor systems engineered for all types of industry write:

QUALITY
OVERHEAD
CONVEYOR
SYSTEMS

CHAINVEYOR®

CORPORATION

Engineers & Manufacturers

DISTRIBUTORS IN ALL PRINCIPAL CITIES

MAIN OFFICES:

5618 E. WASHINGTON BLVD., LOS ANGELES 22, CALIFORNIA

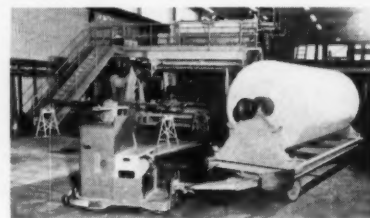
Circle 30 on Reader Service Card

COST CUTTING IDEAS

Driverless Tractor Tows Heavy Paper Rolls

Expanded operations forced the Blandin Paper Co., Grand Rapids, Mich. to find a better way to handle paper stock. They installed a new coating machine on a mezzanine. Rolls of paper stock 18-feet long, weighing 12,000 lb. had to be lifted by overhead hoist from the floor below, then moved to the coating machine. To transport the cumbersome rolls once they were on the upper level, Blandin bought a driverless industrial tractor system to tow a trailer on which the paper rolls would be placed.

The hoist now lifts the roll to the mezzanine and accurately positions the roll in the trailer. The tractor tows the trailer along a 200-foot guided route to the paper coating machine. The tractor automatically stops at the exact position the paper roll needs to be in for machine feeding. After the



paper roll leaves the trailer, the operator presses a button on the steering column of the tractor. This returns the tractor to the starting place.

Blandin says it likes the low cost of installing the system; its safety (it runs at constant speed); and the accuracy of each trip over the fixed path.

The trailer returns five empty paper core spools at a time. Each spool weighs 1,500 lb.—Barrett-Cravens Co.

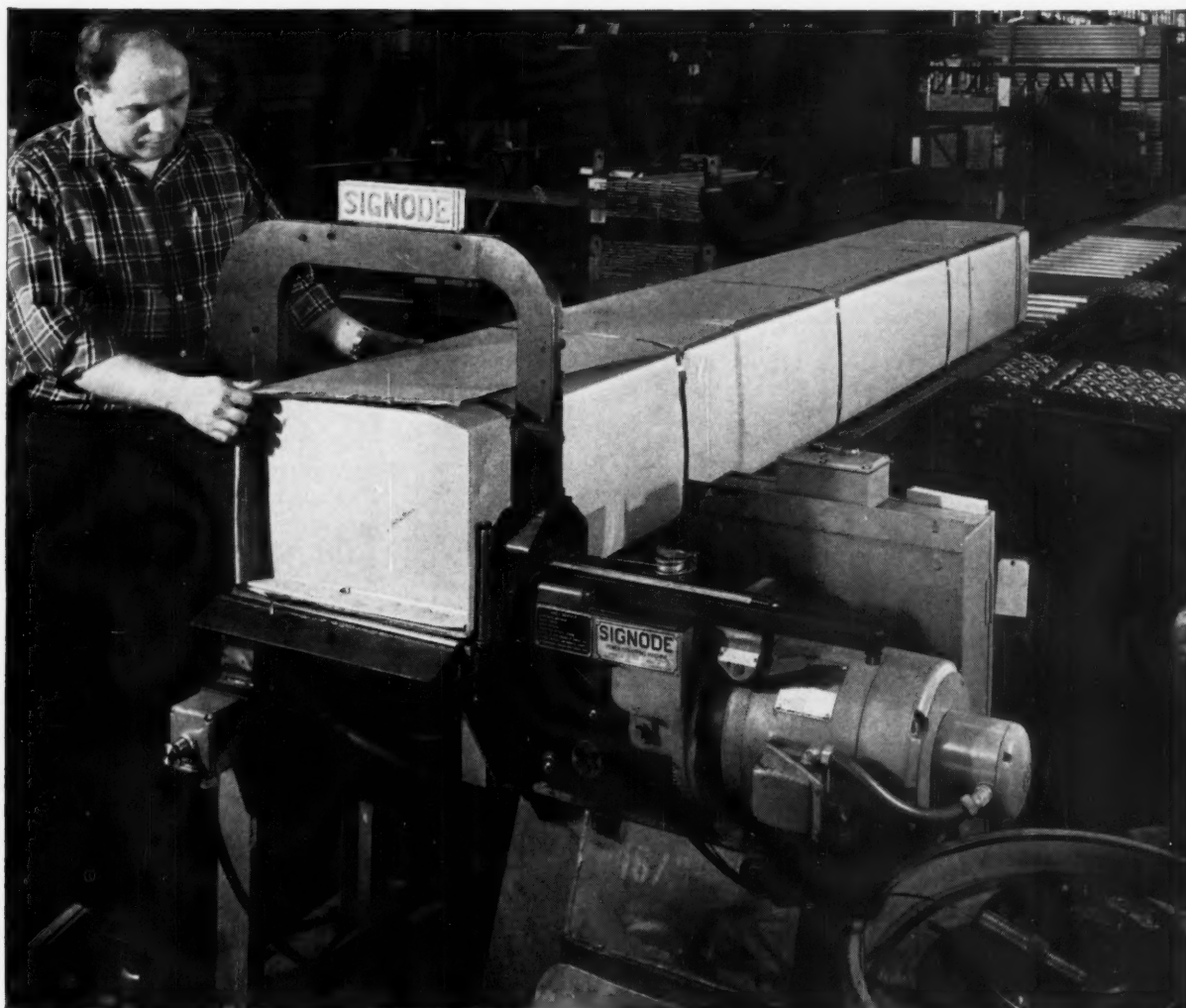
Circle 256 on Reader Service Card

Adjustable Speed Drive Increases Production

A mechanical adjustable speed drive on a pineapple processing

Continued on page 44

MATERIAL HANDLING ENGINEERING



New Signode high-speed strapping machines

It's simple. The operator positions the package or bundle, steps on the foot switch, and the strapping is applied, sealed, and severed in seconds ... more than fast enough for the highest production rates.

New M-20 Series machines apply strapping smoothly, without impact, without denting or marring your product. They maintain uniform tension at any desired value between 50 and 1500 pounds.

Life tests and up to five years of industrial operation prove that M-20 machines complete half a million strapping operations before requiring more than routine maintenance.

Strap ends are joined mechanically with a metal seal that visibly insures a proper joint regardless of dirt, paint or oil. 3-HP motors insure against overloading even at maximum tension. Easy to use, easy to learn to use. Packages can move through the machine in either direction.

Each M-20 Model straps a wide range of mixed package sizes.

This new series of six standard M-20 machines is the result of 15 years of Signode experience in designing and building most of the power strapping machines now in use.

Write or wire
today for your free copy of
fact-packed booklet,
"Signode M-20 Series Standard
Power Strapping Machines."



First in steel strapping

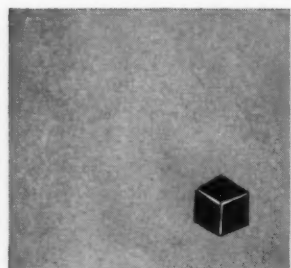
SIGNODE STEEL STRAPPING CO.

2618 N. Western Avenue, Chicago 47, Illinois

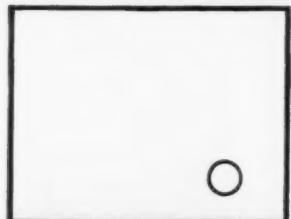
Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide

In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

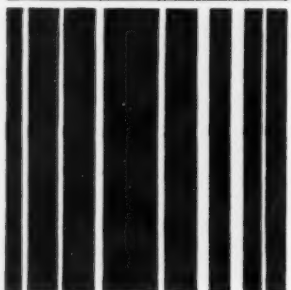
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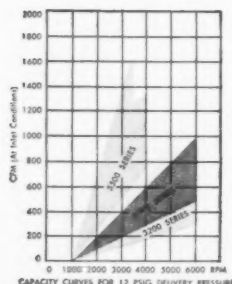
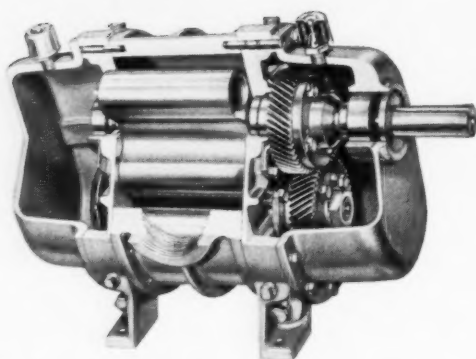
**SMALLEST CUBE
DIMENSIONS**



**LIGHTEST
WEIGHT**



**WIDEST
PRESSURE RANGE**




WITH M-D 3-LOBE BLOWERS

If space and weight of the blower is a concern in your design problem, consider this fact. M-D rotary positive blowers because of their unique 3-lobe design require smaller cubic space than any other blowers. A survey shows that a 14 PSI M-D takes 3/4 to less than 1/10 the space of competitive models . . . and in some cases are only 1/10 the weight.

M-D Blowers operate at wider pressure and speed ranges than any other rotary positive blower. Capacities of 30 production models range from 30 to 4000 CFM, pressures to 15 PSIG single, 70 PSIG multi-stage.



For full information write
M-D BLOWERS, INC., RACINE, WISCONSIN

A SUBSIDIARY OF  **MIHLE-GOSS-DEXTER, INC.**

Circle 72 on Reader Service Card

COST CUTTING IDEAS

machine increases production and cuts downtime at the Dole Corporation cannery in Honolulu.

The machine reduces whole pineapples into separate parts of cores, shells, pulp, and cylinders of fruit ready for trimming and slicing. The machine handles 6,000 pineapples an hour. Then skilled workers, ranged along either side of conveyorized trimming tables, trim off imperfections before the cylinders are sliced and canned.

The adjustable speed drive reduces the need of supervisory attention. It prevents idle time on the trimming table. The operator can select a higher speed following a shut down. When the conveyors are again filled, he can cut the speed to the normal rate. Speed range: 780 to 195 rpm.—*General Electric Co.*

Circle 257 on Reader Service Card

Cuts Delivery Costs

National Sugar Refining Company found it was expensive and wasteful to deliver sugar in bags to candy makers, bakeries, and food processors.

The sugar bags had to be loaded from the trailers to fork trucks, then onto skids to go into the plant. Bags sometimes split, spilling sugar.

The solution: the company replaced bag delivery with bulk, cut their handling costs and eliminated waste. They use a transport trailer which pneumatically discharges its 15-ton payload in less than an hour.

The transport is a 42-ft.-overall tractor-semi-trailer. It has 3 sugar compartments, 10,000 lb. capacity each. The sugar funnels from each compartment into a common under-slung transport line that connects to a plant pipeline.

Savings in price are nearly 25 cents a 100 lb. over bagged deliveries. But the company says the savings reach nearly 50 cents when you take in savings on in-plant handling.—*Fuller Co.*

Circle 258 on Reader Service Card

MATERIAL HANDLING ENGINEERING

No Damage As Tires Roll Over Steel Chips

Tires on this Yale yard shovel are constructed of many rubber wedges by the Notat Tire Co. It's a solid rubber tire, has no tube,



no air chamber. It cannot go flat.

This construction enables them to run over sharp stone, glass, brick, nails and metal without failing. You can install them on a variety of material handling equipment.

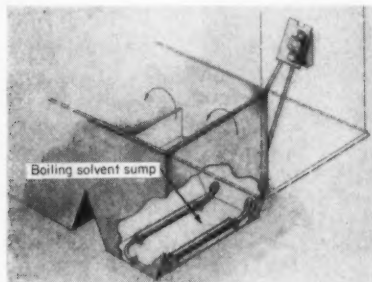
They provide great traction and fast braking even on wet and icy surfaces. Wide range of standard sizes.—Notat Tire Co.

Circle 259 on Reader Service Card

Vapor Degreaser Cleaned Automatically

A tubular type conveyor, on a vapor degreaser, removes the accumulating chips and sludge. The cleaning comes about from the movement of circular flights through the round casing. The casing has openings at the receiving and discharge points.

You used to have to shut the degreaser down, drain the sump, and



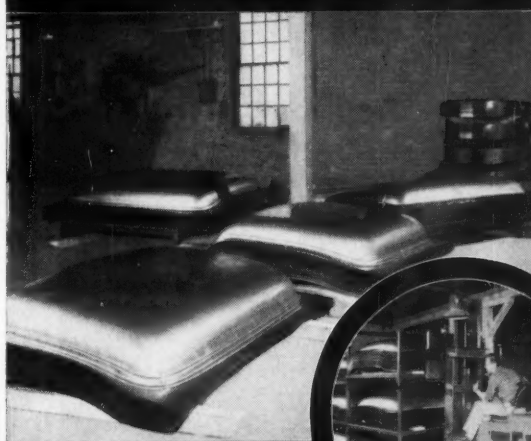
manually remove the sediment. Besides labor costs, the downtime was costly. That's all over. A short conveyor operating period each day now removes all sediment. The machine can be operated while being cleaned.

Conveyor Division, Hapman Corp.

Circle 260 on Reader Service Card

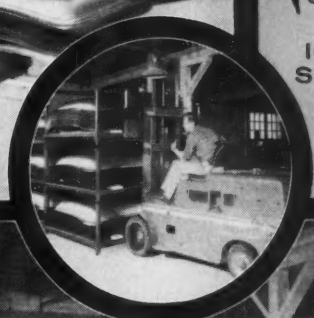
April, 1961

ERCO STAK-PAL SPACE-SAVER



McLaughlin Body Co. found old method of stacking — wasteful and time consuming.

Invested in STAK-PAL Stacking racks (below)



- Economy of space
- Eliminates Damage to products
- Safer handling
- Better storage
- Greater efficiency
- Productivity
- Unlimited Stacking.



ONE UNIVERSAL CARRIER THROUGH PRODUCTION!

One base and any combination of posts, sides, ends or enclosures to give you the Universal method of HANDLING and STORAGE of most all materials. Heavy tubular steel construction insures long life. STAK-PALS produce major reductions of handling and storage costs for both large and small companies at low initial investment and rapid amortization.

Write for literature.

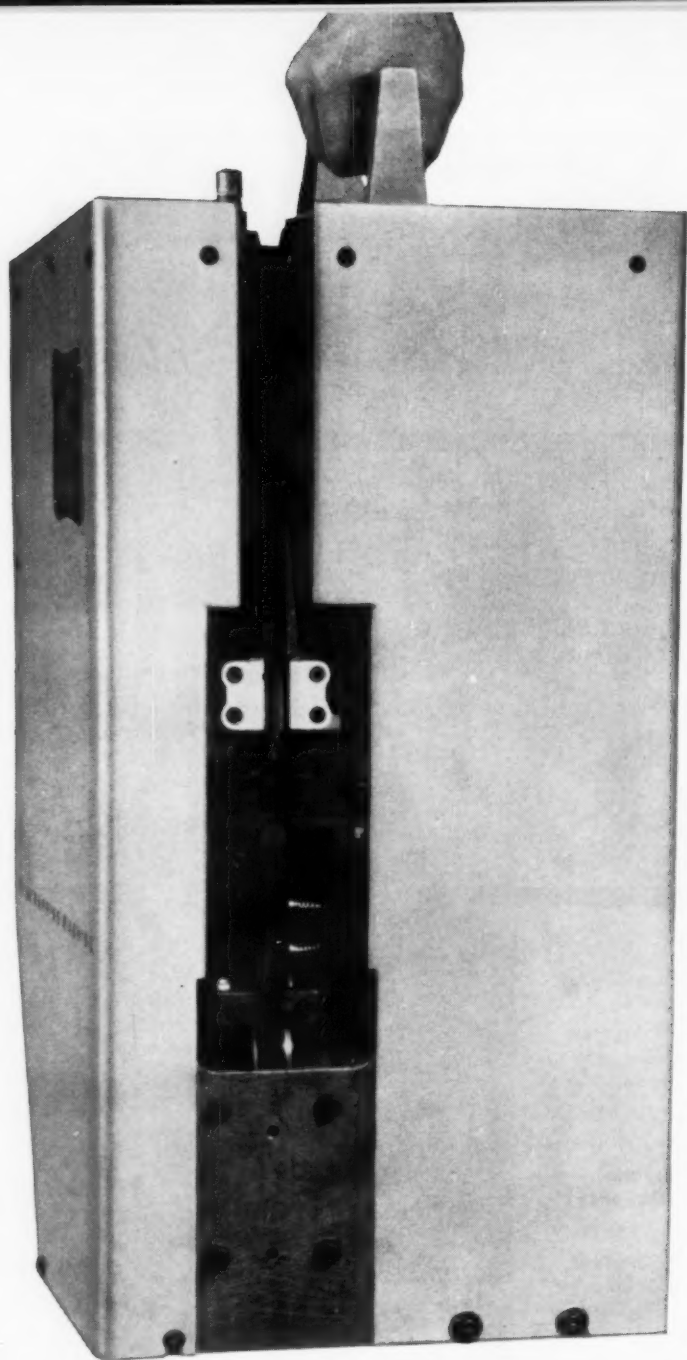


C. E. ROBINSON
COMPANY
222 COLBURN AVENUE
JOLIET, ILLINOIS

Telephone: SARatoga 3-3403



Circle 101 on Reader Service Card



Now, Acme Steel brings you (*literally!*)
the world's first strapping machine with

**FULL-SIZE
PERFORMANCE...**



PINT-SIZE PRICE

THE REVOLUTIONARY

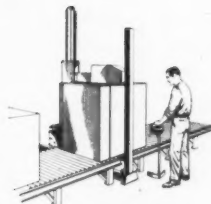


... so compact, we can carry it right into your plant ... so complete, it does everything you want a powered strapping machine for: fast feeding, tensioning, sealing and cutting. And so conservative in cost!

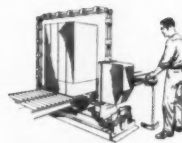
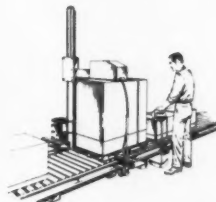
The new F7 is not a stripped down facsimile of a larger machine. Its surprisingly low initial cost and operating economy are engineered into the strapping mechanism—a 75 pound, self-contained unit that doesn't rely on complex (and costly to service) electronic circuits. You can adapt it for any regular duty strapping job, equip it for the exact degree of automation you desire (at right are a half dozen actual applications).

Now, even modest volume operations can discard outmoded methods. Big users can set up additional strapping lines at a fraction of their former cost. And everyone can give production bottlenecks the slip—the low-cost F7 strapping mechanism can be replaced with a standby in a few minutes!

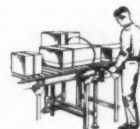
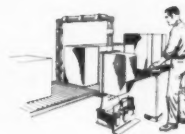
Call your Acme Idea Man for a quick carry-in demonstration. See how the new F7 can handle your packaging operation at a greater profit. Or, return the coupon for full facts.



A HALF DOZEN WAYS



THE F7 CAN LOWER



PACKAGING COSTS



IDEA LEADER IN
STRAPPING

ACME STEEL COMPANY

Dept. MES-41, 135th St. & Perry Ave.
Chicago 27, Illinois.

- ☐ I would like an F7 demonstration in my plant.
☐ Send complete information on the new F7.

NAME _____

TITLE _____

FIRM _____

ADDRESS _____

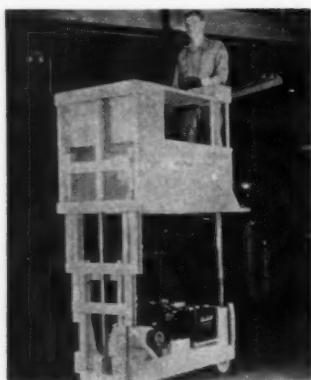
CITY _____ ZONE _____ STATE _____



PRODUCT NEWS

Powered, Elevating Cart Lifts Stock Picker

Bin Selector travels under its own power, raises entire body on 3-stage roller mast. Operator rides to bin,



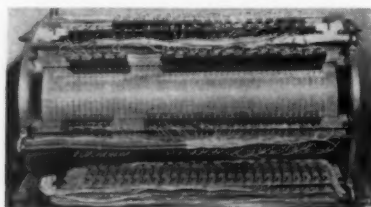
selects from any height, rides to next bin or packing area. Rapid, safe, ends climbing, walking, fatigue. A deck at knee height, another waist high. Fits 36-in. aisles, upper shelf lifts to 88 in. Carries 1,000 lb. travels 5 mph.

The Heifred Corporation

Circle 301 on Reader Service Card

Memory for Conveyors

Dynastat magnetic memory drum synchronizes with conveyor or rotary table. It remembers where each piece entering a system is going. Information may come from a keyboard or automatic sensing, testing, or gaging equipment. When a piece reaches its destination the drum trips mechan-



isms that take the piece off the conveyor. Flux responsive heads read whether drum moves or is stationary. Suitable for stepping or continuous

operations. High power output (1.5 volts DC into 1,000 ohms), needs no sensitive amplifiers. Ten-channel, 2,000-bit drum fits into space 14 inches square by 26 inches long. Cost is low.

Consolidated Controls Corp.

Circle 302 on Reader Service Card

Short Truck, Tall Lift

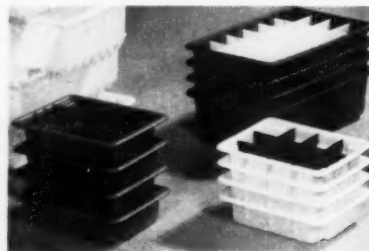
Three-stage nesting mast for maker's line of narrow aisle fork trucks boosts elevation range, retains low profile. Trucks enter highway trailers, go through low doorways, will lift 4,000 lb. to 180 inches.

Raymond Corporation

Circle 303 on Reader Service Card

Space Savers

Totem deep nesting boxes take little storage space. Adjustable sep-



arators divide them into any choice of compartments. Made of heavy plastic, resistant to grease, acids. Retain size and shape from minus 180 to 250°F. Rounded corners, easy to clean. Colorfast, wide range of sizes.

Pioneer Products, Inc.

Circle 304 on Reader Service Card

High Starting Torque

Wound rotor motors from ½ through 40 hp for jobs with heavy starting inertias, minimum high speed power. Typical jobs—cranes, elevators, printing presses. High starting torque applied in slow-speed step, full speed reached in series of steps. Lightweight, heat-dissipating aluminum alloy frames, drip-proof or total-

ly enclosed. Sizes 182 to No. 326-U. *Reuland Electric Co.*

Circle 305 on Reader Service Card

Heavy Belt Splices

Flexo fasteners for heavy conveyor belts are countersunk below the belt



surface. Fastener teeth penetrate belt carcass for best joint strength. Countersinking the plates means clean scraper operation, better joint life, less wear on idler bearings. Maker has two special tools for countersinking job.

Flexible Steel Lacing Co.

Circle 306 on Reader Service Card

Touch-Sensitive Bumper

Bumper for towline trucks automatically releases tow pin, applies brakes on contact with stop, obstruction, another truck, or people. Re-engages itself when released. For accumulation on power switch-offs,



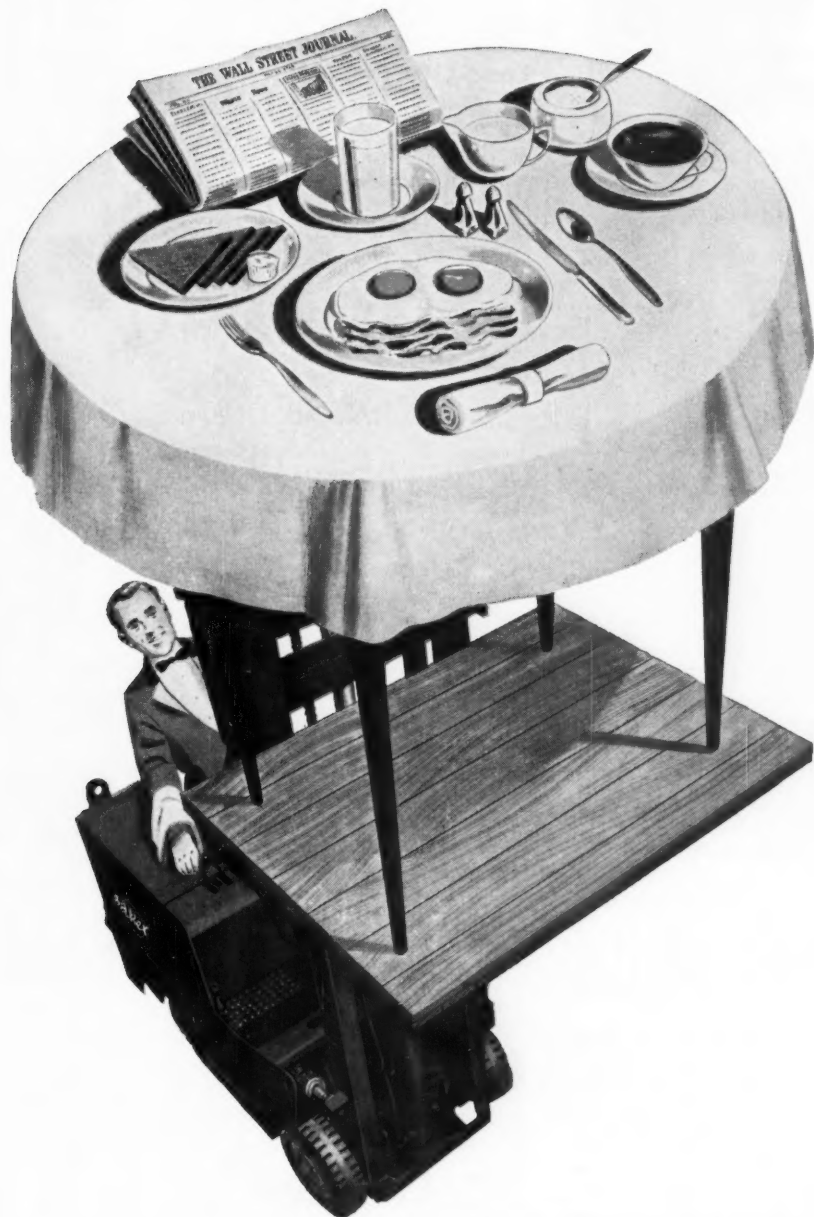
converging conveyors, automatic stop points.

SI Handling Systems, Inc.

Circle 307 on Reader Service Card

Continued on page 50

BREAKFAST IS SERVED...



...AND BAKER HELPED BRING IT!!!

Juice, cereal, eggs, coffee, even herrings and yogurt—whatever your breakfast preference, chances are, Baker has a hand in serving it. 9½ million tons of materials are moved each week by Baker trucks. This tonnage of food products would feed the entire United States 3 meals a day for 5½ weeks.

Baker electric trucks are balance-design engineered to every application in the food industry. Smooth electric acceleration

and two-speed dynamic braking ensure complete driver control to prevent load damage—fragile foods delicately handled by zero to maximum metering of the hydraulic system.

Your local Baker dealer will be glad to demonstrate how Baker electric trucks ensure *speedy* delivery of crisp, fresh, *nature-flavored* foods. Or write for Baker food handling application story BAS-611.

Baker also manufactures a full line of gas and LP gas trucks for every application.

Free illustrated manual on fork truck safety-operating hints available for each of your drivers. Write Baker Industrial Trucks, 8019 Baker Avenue, Cleveland 2, Ohio.

A DIVISION OF OTIS ELEVATOR COMPANY
Baker. BAKER
 BAKER INDUSTRIAL TRUCKS • CLEVELAND 2, OHIO

*This Hopper
on your truck*

**CAN
CUT
HANDLING
COSTS
50%**

Here's the fastest, lowest cost method of handling bulk materials and small parts—hot or cold, wet or dry.

One man with a Roura Hopper can do the work of two and do it in half the time. Loaded Hopper is picked up by the truck operator in a matter of seconds. Platform or forks slip into underframe and it can't slip off.



DUMPS ITSELF



RIGHTS ITSELF



LOCKS ITSELF

Loaded Hopper is transported to its destination—operator trips the latch—and the Hopper automatically dumps its load, rights itself, locks itself.

Thousands of Roura Hoppers are now in use handling scrap metal, hot forgings and castings, cinders and aggregate, pickles—and dozens of other items.

They're made in eight sizes, $\frac{1}{8}$ to 4 yards capacity. Built of $\frac{3}{16}$ " steel plate with continuous arc-welded seams. Heavier plate if desired, also stainless steel or galvanized. Mounted on live skids or with a choice of wheels. Can ship standard models immediately.

**ROURA
Self-Dumping
HOPPER**

ASK FOR BOOKLET. Just clip this coupon to your letterhead and mail. We'll send illustrated literature. No obligation.

ROURA IRON WORKS, INC.
1411 Woodland Ave., Detroit 11, Michigan

Circle 104 on Reader Service Card

PRODUCT NEWS

Long-Life Pallets

Strong, lightweight Dura-Block pallets take severe shocks; give long maintenance-free service. Wrap-free 5-ply Douglas fir, water-proof glued



for all weather. Won't shrink or wrack out of square. Flush-bolted with unbreakable steel spacers. Complete size and style range.

Carroll Box & Pallet Co.

Circle 308 on Reader Service Card

Air-Cooled Engines Burn LP Gas

Model A-806-43 regulator converts any small air-cooled engine to LP gas vapor system. Weighs 18 oz., mounts simply on bracket supplied. Combines primary and final stage regulation in one unit. Companion kit modifies gasoline carburetor for LP gas. Models for all popular engines.

The Bendix Corp.

Circle 309 on Reader Service Card

Shelves Adjust Easily

Erectomatic clip-type shelving supports heavy loads on positive-



locking double-grip clips at all 4 corners. There's no wobble, maker says, shelf corners are lapped and spot welded. Shelves adjust on $\frac{1}{8}$ -in. centers to as close as 3 in. apart. They may be slipped in and out without tilting or disturbing contents. Clips useable indefinitely.

*Columbia-Hallowell Division
Standard Pressed Steel Co.*

Circle 310 on Reader Service Card

**For more
PRODUCT NEWS
turn to page 104**

*it's new
it wears
it saves*

*it's ALBION'S
WATER RESISTANT
texite wheel*

Specially molded for applications requiring unusual water or chemical resistance... plus the usual quiet, long-wearing, easy rolling-floor protective characteristics of Albion Texite Wheels.

These tough, high capacity wheels are immediately available from stock in any practical size from $3\frac{1}{4}$ " to 16" diameters, tread widths from $1\frac{1}{2}$ " to 4" and capacities up to 8000 pounds. Plain, roller or sealed bearings. Price? Exactly the same as comparable models in Albion's regular Texite wheel line!

Specify "Low Water Absorption Texite Wheels" on your next caster or wheel order... and save.

FREE CATALOG—Albion's big, new 44-page catalog of Industrial Casters and Wheels is ready for your use and convenience. Write for your personal copy—Today!

**ALBION
INDUSTRIES
INC.** **ai**
ALBION, MICHIGAN
Circle 3 on Reader Service Card
MATERIAL HANDLING ENGINEERING

EXIDE POWER PACKAGE

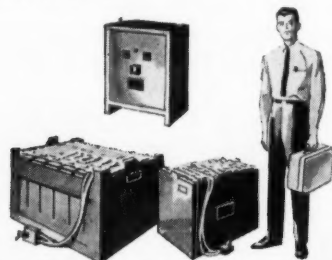
Exide Industrial Marketing Division, The Electric Storage Battery Company, Philadelphia 20, Pa. 



A well-matched pair. Operator connects Exide truck battery to Exide ETR rectifier type charger, especially selected to charge the battery fully within the allotted time.

WHY A BATTERY AND CHARGER SHOULD BE MATCHED

The big reason is economy. In electric truck service, a fully charged battery means your truck can do more work. So you get more done for each dollar of cost. Furthermore, if you don't charge your battery fully each time, you could be shortening its life. And that would add to your cost too. For maximum economy, it is important that your charger have adequate capacity to charge your battery fully, safely and within the allotted time.



The complete Exide power package. Three basic battery types, four charger types, both in complete range of capacities, plus Exide service—all from one dependable source.

Make sure, however, that your charger is not oversized. You only need enough charger capacity to do the job. Any more is wasted. Excess capacity simply represents an overexpenditure of money for your electric power.

Obviously, specifying the battery and charger you need for your own power requirements is an engineering problem. And Exide men approach it on an engineering basis. The objective is to give you the right power package for maximum economy.

The first step in economy is to select the right type and size battery for your truck. This can best be done from a broad battery line. And Exide offers the broadest line of industrial truck batteries on the market, including Exide-Ironclad with tubular positive plate construction; Exide-Powerclad premium flat plate; and the improved Exide nickel-iron-alkaline (invented by Thomas A. Edison). There's a type and size for every truck application.

Second, your Exide man recommends the correct type and size of charger for your particular battery, based upon your

plant conditions. Here he can choose from the four basic industrial truck battery charger types in the Exide line: the vertical motor generator type which saves floor space and initial cost; the new ETR rectifier with low maintenance requirements and longer life; the type PMR rectifier for economy and convenience; and the horizontal motor generator with a long record of dependability, safety and life.

For both batteries and chargers, Exide offers complete service to insure that you get maximum battery and charger life.

Only Exide offers this complete power package—your key to the lowest-cost electric truck power you could buy. Write for complete details. Exide Industrial Marketing Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

Exide®

Circle 43 on Reader Service Card



ADIPRENE® WHEELS OUTLAST RUBBER 2 to 1 IN THIS PUNISHING SIDE DUMPING SERVICE

These paper mill "broke" carts are loaded with up to 3000 pounds of paper, dragged over a steel-mesh-imbedded concrete floor, then pushed over on their *sides* for dumping. This side dumping procedure puts enormous strain on wheel rims—tears the heart out of solid rubber tires. But the paper manufacturer has found that his ADIPRENE wheels stand up twice as long under daily thumping, scraping, grinding treatment.

Yet, even this generous 2 to 1 service ratio is not really typical of ADIPRENE wheel life. In many instances, ADIPRENE wheels outlive others 3 to 1... often, 5 to 1.

Why? ADIPRENE combines resilience with high

hardness. ADIPRENE wheels can carry heavier loads without chipping, gouging or chunking. In addition, they offer outstanding resistance to abrasion and impact... have low starting and rolling resistance... withstand attack by oil, grease, ozone, oxygen, salt solutions and dilute mineral acids and alkalies. And they perform well even at low temperatures (brittle point is below -80°F.).

So, when considering solid tires, caster wheels and pallet wheels, specify ADIPRENE for long life and low maintenance.

For more information write E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Dept. MHE-4, Wilmington 98, Delaware.

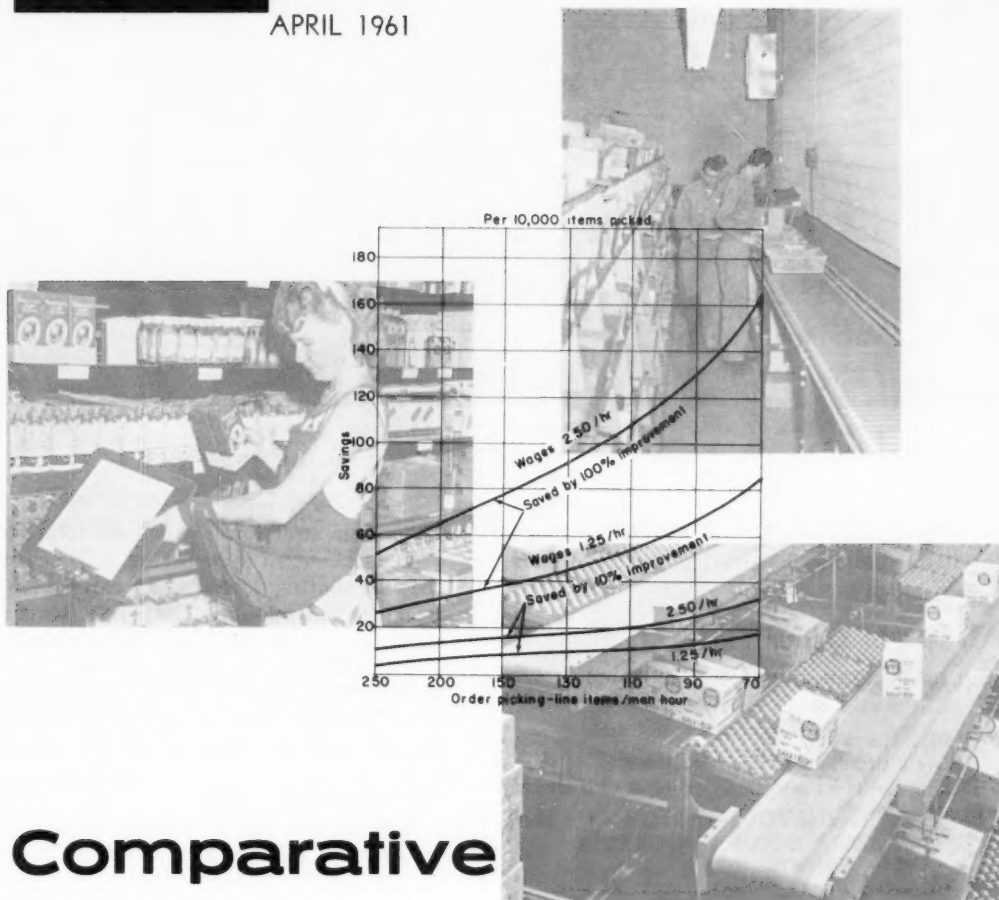


ADIPRENE®
URETHANE RUBBER

Better Things for Better Living... through Chemistry

Circle 40 on Reader Service Card

APRIL 1961



Comparative analysis of order picking systems

By JOHN SPENCER, Associate Editor

WHAT CAN YOU GAIN by improving your order-picking system?

Here's one example: a distribution warehouse handling package goods moved to a new building, used the opportunity to improve order-picking. Without changing help or even adding much equipment, it doubled order picking capacity, eliminated overtime, managed to give same-day or 24-hour delivery, in an area extending into five States.

But note this for contrast. A wholesaler changed

his order-picking. It was expected to be an improvement, but he was forced to handle extra paperwork to the tune of 17 extra clerks. Furthermore he lost control of order-picking details so that it was impossible to process rush orders.

The example which showed improvement is one in which a careful study was made to determine the needs. That is what you have to do to get similar benefits. Nobody can give you a simple formula or wonderful machine that increases your order-picking



MANUAL



MECHANIZED



AUTOMATIC

efficiency easily and surely. Improvements come from gathering data, studying it, applying what you learn, and using as much ingenuity as you can muster.

What Costs in Order Filling?

You can break down order filling into these 8 segments:

1. Writing the order
2. Giving instructions to the warehouse
3. Picking the order and transporting it to a checker or inspector
4. Packing
5. Labeling for shipment
6. Loading on carrier's vehicle
7. Making invoices, revising inventory records
8. Restocking and reordering

Of all these activities it is the third (picking the order and transporting it to a checker or inspector) that takes the most man-hours in the average warehouse. The figure is likely to be about 40 percent.

Systems in Use

To improve output per man hour, you have to understand the alternatives to the system you have. To classify, we can say three types of systems are used—manual, mechanized, and automatic. In practice systems are not as sharply defined as the words suggest. Predominantly manual systems may employ some mechanical aids—carts, conveyors, trucks. Mechanical systems merge into the automatic field when you add a device that automatically routes a tote box over one or the other of two conveyors. So we will make these distinctions:

In a manual system, the order picker goes to the shelf, gets the items and takes them to the place where they are checked and packed for shipment. He may use a hand-propelled cart, but sometimes his equipment is no more than an apron with arm loops on its

lower hem so it forms a bag for toting the items.

In mechanized systems the pickers place items on the transporting device which carry them to checking, packing, and shipping. For larger items and case lots they may use lift trucks, etc. to handle goods on pallets and the like. Conveyor systems may move smaller or lighter items. Tow-line conveyors are popular. The heaviest items, such as those found in a steel warehouse demand traveling cranes. The mechanical equipment does all the heavy lifting, and transporting, but the equipment is guided by human hands.

Newest and most glamorous of the order picking systems are the automatics. The order picking is accomplished by pushing buttons on a console, or even by having punched cards do it. A transporting conveyor moves the items from storage and carries them to accumulators, ready for checking and packing.

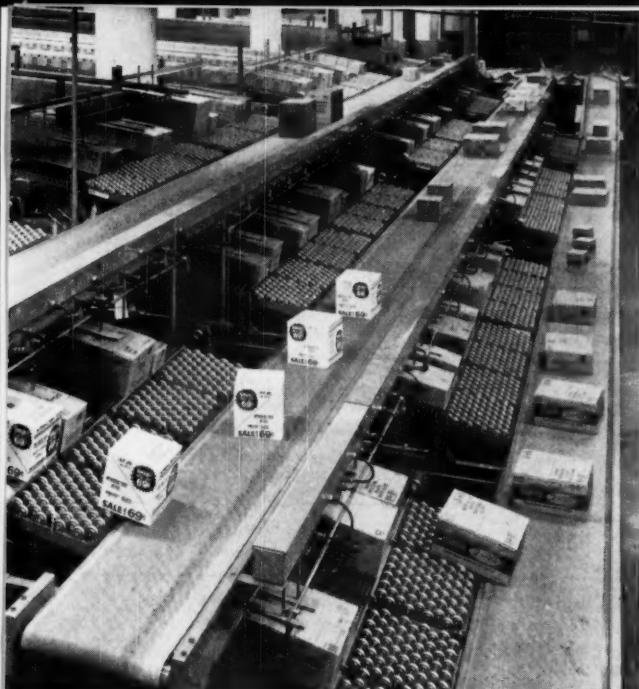
What Makes a System Good?

Judge a system by these four main criteria:

1. Will it assemble the order without error, soon enough to keep the customer happy?
2. What is the total cost, in man-hours, of the order-picking activity?
3. What is the actual speed with which the order is filled, above the minimum demands of the customer?
4. How does it cope with rush orders and unusually heavy peak loads? Does it work during repairs?

The first criterion is not very difficult to meet. Any workable system should deliver picked orders to the checker with very few errors, 0.1 percent or less. This is a matter of identifying the items on the order and on the shelf or bin, and training pickers.

Criterion 2 is harder. There is no measure for a system in terms of the number of man-hours required to pick a given number, say 10,000, line items. Too



many factors influence performance. Some of these you can control, others are inherent in the product or in the form in which it is ordered. Here are some of the influences which make a big difference:

INHERENT

Handling in broken case, or full lot	Valuable items kept under lock
Size and weight of product	Number of items on single order
Refrigerated or frozen items	

CONTROLLABLE

Number of items in picker's zone	Use of mechanical equipment to minimize picker fatigue
Locating items so picker travels shortest route	Traffic in order-picking area
Making items easy for picker to find and identify	Training of pickers
Amount of paperwork picker must complete	Procedure on "out of stock," "partial," and "back order" items.
Type of bins or racks	Volume and turnover

The reasons in the table account for the fact that items picked per man-hour may vary from a low of 22 to a high of over 440 for manual and mechanical systems. In most systems the rate is 70 to 150 items per man-hour. The variations are so wide that it is not wise to compare two warehouses on the basis of items per man-hour unless the two are very nearly alike. On the other hand, as a measure of improvement in a specific warehouse, items per man hour can be one of the best gages.

Aim for a Big Improvement

Table 1 shows that small improvements in picking-rate do not produce spectacular savings in money, because pickers are low paid. The easy gains, from better supervision and control, more attention of location according to popularity, and similar improvements produce moderate cost savings. But the big opportunity lies in at least doubling the productivity of pickers. The table shows you can save \$30,000 a year by doubling if your system handles 10,000 line items a day, if pickers picked 110 items an hour and if wages are \$2.50 an hour.

A gain of this order takes skill. To see if you can do it, follow these steps: Analyze your data on operations to find out how many of the improvements in the next section of this article apply to you. Make a plan, estimating the expected improvement.

How To Improve Your Picking Rates

Warehouses vary widely, and so do the ways of improving picking rates. Picking heavy, palletized motors with fork trucks is not like picking bottles of aspirin by hand. However, these rules help to increase productivity.

- **Keep Paperwork in the Office:** Reduce that done by order pickers to checking a few squares and initialing, if you can.
- **Arrange Items in Warehouse by Popularity:** Place fast-moving items where they are easiest to reach.
- **Give Picker Picking Slips Arranged by Location:** A girl in your office can put slips in order faster than a picker can do it on the plant floor. You save him from back-tracking, errors. If he picks from an order, arrange items on it. Easiest solu-

TABLE 1—HOW IMPROVEMENT OF LINE ITEMS PICKED PER HOUR SAVES MONEY

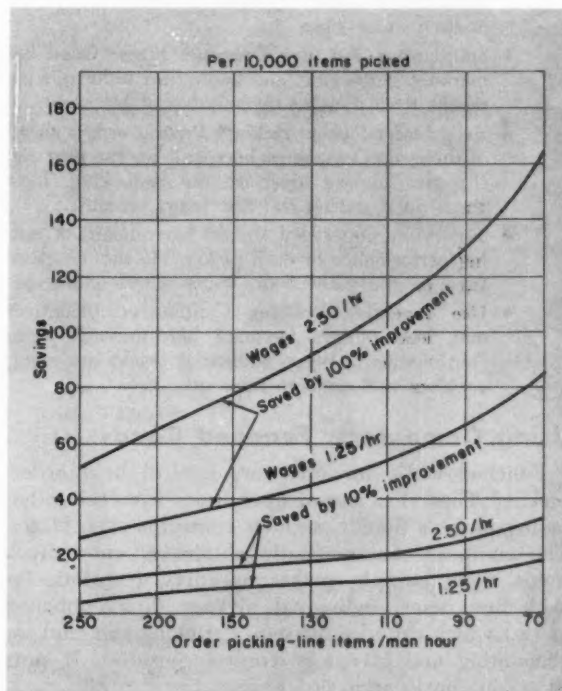


TABLE 2—HOW SYSTEMS FILL NEEDS

CHARACTERISTICS	MANUAL	MECHANIZED	AUTOMATIC
Velocity (turnover) of Items Picked	Low turn-over favors manual system	Best for moderate or high turnover	Best for small number of very high turn-over items
Number of different line items	Can handle unlimited number	Can handle unlimited number	Can handle only limited number, usually 25-100
Size of packages or units	Limited to what man can readily lift or carry	No limits. Conveyor, lift truck, crane may be used	Best if item is not too large
Shape of packages or units	No limit on shapes	Best for standardized shapes	Can handle only limited number of shapes
Weight of package or unit	Limited to what man can readily lift or carry	No limits	Heavy items may cause impact problems
Service and flexibility	Extremely flexible. Service can be increased by adding manpower	Service limited by capacity of available equipment. May be supplemented by manual operation in emergency	Service limited to design capacity
Volume	High or low volume. Best if total volume is high, but volume of individual items very low, or rapidly changing	High or low volume, depending on type of equipment	Best for high volume concentrated in few items
Special	Good for fragile items	Necessary for all items weighing more than man can carry	Excellent for frozen items, those sensitive to damage by light, odors

tion—use a computer, have it do the arranging.

- Use Location Numbers on Picking Slips: Pickers read number faster than names.
- Keep Cross Traffic out of Picking Areas. This applies to re-stocking as well as unrelated traffic.
- Don't Give Picker Slips for Out-of-Stock Items: Examine inventory records in office, so picker doesn't waste time.
- Standardize Bin and Container Sizes: Good bin marking, restocking, and finding for order picking results from limiting the number of bin sizes.
- Keep Order Pickers Picking: Process orders ahead of them, don't make pickers wait for the next set. If order pickers must do the restocking, have them do it during the first hours on shift.
- Supervise: Supervisor should have means of noting performance of each picker. He should spend time on the plant floor, know what's going on.
- Use Incentive Systems Cautiously: Incentives may lead pickers to mark hard-to-reach items "out-of-stock." When industrial trucks are used, accident and damage rates may rise.

Using Computers, Punched Cards

Punched cards for inventory control help order-picking. They clear out-of-stock items from the order, saving picker's time. Computer control is even better. The computer automatically eliminates out-of-stock items, notes partials, makes re-orders. It prints, for each line items, individual picking slips (punched cards) which can also serve as a packing slip, and for accounting and inventory control purposes. It puts these slips in location order.

Warehouse operations have been one of the most successful fields for computing equipment. Big question: how large must the business be to afford a computer? The answer depends on the number of jobs the management can turn over to the computer. If the machine writes orders, keeps inventories, prepares invoices, makes up payrolls, analyzes sales records, forecast sales, etc., then it can be justified for a business of moderate size.

Training Order Pickers

Training order pickers (and retraining experienced pickers) helps productivity, but it is often neglected. Teach all these subjects to new pickers and teach the checked items in the retraining courses:

- Location system used
- ✓ Picking slips, other paper forms
- ✓ Rush order procedures
- ✓ Preventing errors
- ✓ Importance of service to customers
- ✓ What to do if items on shelf are shopworn or damaged
- Stock arrangement
- ✓ Quantities, units, and other technical forms
- ✓ Use of equipment
- Stock replenishment
- ✓ What to do when picking slip or order is in error
- ✓ Housekeeping

It is not possible to say who should use a manual, or mechanized, or fully automatic system without considering all the factors mentioned previously. Table 2 shows some of the conditions which favor each type. Be sure to keep up with equipment developments when buying. ♦

What's your handling information IQ?

How effective is your reading in material handling?

Do you read to remember, to store up ideas that you can parlay into new plans, systems, installations?

Take this 10-minute test on information which has been published in MHE during the last 12 months. Check your knowledge of engineering, MH products, important people and happenings, and career opportunities.

So . . . on with the test. It will be a few minutes well spent, especially if it gives you the incentive to start a program aimed at improving your MH information and upgrading your job.

Instructions: Check the one word or phrase that completes the statement. Compare your answers with those on page 59. Give yourself one point for each answer. Perfect score is 50 points.

1. A system of storage that features random location of the product:

popularity system ☐ bin system ☐ slot system ☐

2. Recommended load bearing capacity of a receiving platform for a 2000-lb. lift truck:

200 lb. sq. ft. ☐ 300 lb. sq. ft. ☐ 400 lb. sq. ft. ☐

3. A common method of specifying yard crane capacity is the use of these factors: a 30-ft. boom, operated at a radius of:

10 ft. ☐ 15 ft. ☐ 20 ft. ☐

4. Under the Freeman plan described in "Better Status—a New Plan," the highest degree a material handling man could receive would be:

Associate Material Handling Engineer ☐

Honorary Fellow of Material Handling Engineering ☐

Fellow of Material Handling Engineering ☐

5. The factor of safety of wire rope (relationship of breaking strength to recommended safe load) is:

3 to 1 ☐ 5 to 1 ☐ 7 to 1 ☐

6. Van container subcommittee of the MH5 Committee recommends a standard width and height of:

8 x 8 ft. ☐ 10 x 10 ft. ☐ 8 x 10 ft. ☐

7. For industrial-tread tires, tensile strength is the number of pounds needed to break a rubber strip one inch wide with a thickness of:

.075 inch ☐ .75 inch ☐ 7.5 inch ☐

8. President of The Material Handling Institute is:

Robert F. Moody ☐

Robert Rutherford ☐

Charles Lippman ☐

9. Fuel cell test models have run at efficiencies of:

30 - 50% ☐ 60 - 80% ☐ over 90% ☐

10. Squirrel cage motors rated as Design B by the National Electrical Manufacturers Association have normal slip, which is a difference between synchronous speed and full load speed of:

less than 5% ☐ from 5 to 8% ☐ over 8% ☐

11. When laying out conveyor lines to palletize multiple products automatically, the formula $\frac{nL}{12}$ (number of cases per pallet times length of case divided by 12) will give you the maximum length of the:
primary conveyor ☐ secondary conveyor ☐ palletizer ☐

12. Standard width of platform edge for an individual carrier at truck dock:
12 feet ☐ 10 feet ☐ 15 feet ☐

13. Under the Freeman plan, the central institution for records and information would be called:
University of Material Handling ☐
Central Agency of Material Handling ☐
American Institute of Material Handling ☐

14. A factor that will increase the popularity of yard storage in the future is:
containerization ☐ electronic controls ☐ industrial TV ☐

15. As reported at the Cargo Handling Exposition, a standard containerization program will reduce waterfront handling costs from \$12 a ton to:
\$10 a ton ☐ \$8 a ton ☐ \$6 a ton ☐

16. The AMA Packaging Exposition, April 10-13, will be held in:
New York ☐ Cleveland ☐ Chicago ☐

17. An automatic storage system consisting of a wall of compartments, a stock retrieving device, and an electronic console, was originally used only in the warehouse, is now being used in:
in-process storage ☐ yard storage ☐ truck depots ☐

18. Material handling is a factor in a certain percentage of industrial accidents:
10 - 20% ☐ 20 - 30% ☐ 25 - 40% ☐

19. Underground warehousing is developing in:
coal mines ☐ limestone mines ☐ silver mines ☐

20. Most dock levelers are built to a capacity of:
5000 lb. ☐ 10,000 lb. ☐ 20,000 lb. ☐

21. Most truck levelers are:
hydraulic ☐ pneumatic ☐ mechanical ☐

22. You can get various devices for lift trucks that will make a permanent record of motion, distance, engine time, and:
number of lifts ☐ fuel consumption ☐ tonnage carried ☐

23. President of The Society of Packaging and Handling Engineers is:
Robert F. Moody ☐
Robert Rutherford ☐
Charles Lippman ☐

24. Recording devices can be inserted in packages to provide data on:
pressure ☐ impact ☐ travel speed ☐

25. Containerized jet cargo service will be a reality soon, using aircraft with a:
built-in hoist ☐ roller conveyor floor ☐ swing tail ☐

26. The MHI Eastern States Show, May 9-11, will be held in:
New York ☐ Philadelphia ☐ Baltimore ☐

27. You would probably NOT use one of the following types of conveyor for lumpy material:
screw ☐ trough belt ☐ en masse ☐

28. The three most popular lift truck attachments are side-shifters, rotators, and:
rams ☐ clamps ☐ scoops ☐

29. In a diesel engine, a spray of fuel squirts into the hot compressed air near the end of the:
intake stroke ☐ compression stroke ☐ power stroke ☐

30. As surveyed in "Who Is Mr. Average in Material Handling?" the average age of the material handling man is:
33 ☐ 38 ☐ 42 ☐

31. By addition of a turbocharger, a diesel engine turning at 3000 r.p.m. and developing 115 hp. can boost its output up to:
125 hp. ☐ 130 hp. ☐ 160 hp. ☐

32. According to pallet rack nomenclature specified by the Rack Manufacturers' Institute, the distance spanned by the shelf between two upright frames is called the:
bay ☐ clearance ☐ deck ☐

33. The range of MH costs in relation to all production costs is from:
5 - 30% ☐ 35 - 75% ☐ 20 - 40% ☐

34. The corporate managers of tomorrow will be the men who have a background in:
sales ☐ production ☐ material control ☐

35. Standard dimensions of a 4000 lb. steel mesh returnable container are:
32 x 40 x 28 ☐ 33 x 36 x 24 ☐ 40 x 48 x 24 ☐

36. All pallet base returnable containers can be divided into:
4 types ☐ 8 types ☐ 12 types ☐

37. "A Career in Material Control—How Do You Fit In?" predicted a management level job in this field. This job will carry the title:
Material Handling Director ☐
Manager of Product Distribution ☐
Manager of Material Flow ☐

38. Hoist hooks are designed to lift with the center of gravity of a load directly beneath the hook on a line through the:
shank of the hook ☐
point of the hook ☐
edge of the hook ☐

39. President of The American Material Handling Society is:

- Robert F. Moody ☐
Robert Rutherford ☐
Charles Lippman ☐

40. One of the liabilities of inventory is:

- asset value ☐ availability ☐ dollar lock-up ☐

41. Automatic palletizing can save you money if you stack and move as few as:

- 12 cartons a minute ☐
20 cartons a minute ☐
30 cartons a minute ☐

42. The Packaging Machinery Manufacturers Institute Show, November 7-10, will be held in:

- Detroit ☐ Cleveland ☐ New York ☐

43. The recommended number of vendors to whom you should send requests to bid is:

- one ☐ three ☐ five ☐

44. Most fork lift trucks are warranted for:

- 90 days ☐ 180 days ☐ 1 year ☐

45. A good average working figure for automatic palletizing of cartons is:

- 20 a minute ☐ 40 a minute ☐ 80 a minute ☐

46. "Exposing the Phony Consultant" warns you to beware of a consulting fee based on:

- percentage of savings ☐ per diem ☐ fixed fee ☐

47. "How Material Control Aids Your Company Operation" advises that as much inventory as possible should be shifted back to:

- the warehouse ☐
the manufacturing cycle ☐
the shipping dock ☐

48. The U.S. Naval Supply Center in Bayonne has 4800 feet of interconnected feeder conveyors. Orders are controlled on these conveyors by:

- electronic console ☐ Ramac ☐ punched tape ☐

49. One of the recent developments in handling paper-work between departments is the use of an:

- overhead conveyor ☐ in-wall chute ☐ aluminum cart ☐

50. A gasoline-engine powered narrow-aisle fork truck was introduced; it features a:

- single drive wheel ☐ pivoting front end ☐ special forks ☐

Rate Yourself

Add up the right answers. If you score 50, you're an MH man who's on top of his job—and his reading. If you score from 40 to 49, you rate as a sharp and well-informed professional. From 30 to 39 pegs you as an MH man who has a few blind spots in his knowledge—maybe you drew blanks in one or two categories. A score of 20 to 29 ranks you dangerously low; either you're a specialist who doesn't care about

anything except his specialty, or your general information is sketchy. From 10 to 19 indicates that you don't do enough material handling reading, or don't consider it important enough to your career to remember. A score under 10 shows that (a) you just got into the field a few weeks ago, or (b) you have so many MH experts reporting to you that you're not interested in knowing anything personally.

Improve Your Score

If you're not satisfied with your rating, we suggest that you:

- Find the categories you're weakest in. Plan to read more articles that fit these categories.
- If you find that your knowledge of people and events is weak, make a note to read the News Roundup, Associations, and Industry News columns regularly. Better yet, become active in one of the handling societies and participate in meetings, shows, etc.
- If the career opportunities category is your weak spot, read "Better Status—a New Plan," MHE, October 1960, "Manager of Material Flow—Your Next Big Job?" MHE, December 1960, and the Project Upgrade articles published in February and March of this year, plus the one in this issue on page 63.
- Improve your reading speed. There are books, articles, and courses that can teach you how. You'll learn to read more, faster, and remember what you've read better. ♦

- | | |
|--------------------------|---------------------------|
| 25. swing tail | 1. slot system |
| 26. Philadelphia | 2. 200 lb. sq. ft. |
| 27. en masse | 3. 10 ft. |
| 28. clamps | 4. Honorary Fellow of |
| 29. compression stroke | 5. 5 to 1 |
| 30. 42 | 6. 8 x 8 ft. |
| 31. 160 hp. | 7. .075 inch |
| 32. bay | 8. Robert F. Moody |
| 33. 35 - 75% | 9. 60 - 80% |
| 34. material control | 10. less than 5% |
| 35. 40 x 48 x 24 | 11. primary conveyor |
| 36. 8 types | 12. 12 ft. |
| 37. Manager of Mtl. Flow | 13. American Institute of |
| 38. shank of the hook | Material Handling |
| 39. Robert Rutherford | 14. containerization |
| 40. dollar lock-up | 15. \$6 a ton |
| 41. 12 cartons a minute | 16. Chicago |
| 42. Detroit | 17. in-process storage |
| 43. three | 18. 25 - 40% |
| 44. 90 days | 19. limestone mines |
| 45. 40 a minute | 20. 20,000 lb. |
| 46. percent of savings | 21. hydraulic |
| 47. manufacturing cycle | 22. number of lifts |
| 48. electronic console | 23. Charles Lippman |
| 49. overhead conveyor | 24. impact |
| 50. pivoting front end | |

ANSWERS

Match material to system for successful pneumatic

By H. A. STOEES, JR., P. E., Assistant Manager, General Conveying Division, Fuller Company

A PLASTICS PROCESSOR is saving \$13,000 a month by means of his single pneumatic conveyor. This is typical of what pneumatic conveying can do under the right conditions.

For savings like this in your plant, the first step is to make sure your material is suitable for a pneumatic system. Then you have to put in a type of pneumatic conveyor that's right for the material.

So you start with the material and its properties. The material name alone is not enough. Table salt that doesn't pour on rainy days is not the same as salt treated so it pours when it rains. Hidden variations make it essential to know every property of the material which might affect pneumatic conveying. Here are questions you must answer about your material:

- Is it free-flowing?
- Is it hygroscopic (likely to pick up moisture from the air)?
- Does it deliquesce (melt in moisture it picks up from the air)?
- Is it friable (or easy to crumble)?
- Does it matter if the particles break up?
- Is its dust explosive?
- What is its weight per cubic foot, as poured, tapped, conveyed?
- What is its fineness (sieve analysis)?

- What is the particle shape?
- What is its hardness?
- What is the moisture content?

Type of Conveyor for Your Material

After you have the facts about your material at hand, you'll want to talk to a pneumatic conveyor expert about the type of conveyor that fits your needs. Pneumatic systems look simple, but it takes experience to select the kind that gives the desired results. Remember that you are using air, very light and insubstantial stuff, to move substantial tonnages of material fast. Though pneumatic conveying applies the tremendous power of air under pressure, it is far from bulldozing.

Differences in air pressure, volume, velocity, and the way the air is applied to the material, underly differences in types of pneumatic systems. Pressures range from ounces per square inch to more than 100 psig. Positive pressure, or vacuum, or combinations of pressure and vacuum may be used. In application, one method is to suspend the material in a high velocity air stream. Another method aerates or fluidizes the material with air jets, fluffs it up like feathers in a wind, then forces it through the pipes by air pressure.

Table I—PNEUMATIC CONVEYOR TYPE

TYPE	AIR VOLUME	AIR VELOCITY	AIR PRESSURE
Fan	High	High	Low
Medium Velocity	Medium	Medium	Medium
Dense Stream or Fluidized	Low	Low	Medium
Fluid Solids Pump or Blow Tank	Low	Low	Medium or High
Air Activated Gravity Conveyors*	Low	Low	Low

*Though not a pneumatic conveyor according to definitions usual systems for planning purposes.

YOU CAN GET AND WHAT THEY DO

IT CAN HANDLE MATERIAL DENSITY	CAPACITY	COMMENT
Low	Low	Large diameter pipes required; uses either positive pressure or vacuum.
Medium	Fairly High	Activated by positive blower; uses either positive pressure or vacuum.
High	High	Requires positive pressure.
Extremely High	Very High	Pump operates at pressures up to 35 psig.; blow tank at pressures up to 100 psig.
Low to High	High	Low air pressure fluidizes pulverized material, which then flows, under influence of gravity, down inclined pipe (3° to 15° from the horizontal). Material must be finely divided, so at least 30 to 40 percent passes a 200-mesh sieve.

Even, air activated systems should be considered with pneumatic

conveying

A classification of conveyors according to these differences in air requirements is given in Table I. After study of this you can talk to the experienced pneumatic conveyor man in terms both of you will understand. Note that each type of pneumatic conveyor suits a range of density (weight per cu. ft.) of the material. Density, however, is not the only material property to consider in selecting a type. Take all other properties into account. A shortcut is to use a table showing which types actually handle given materials successfully.

Selection Guide

Table II is such a listing. This table gives you a running start toward choosing a conveyor to fit your need, if you find your material or one just like it on the list. Of course the volume you handle and other conditions must temper your choice.

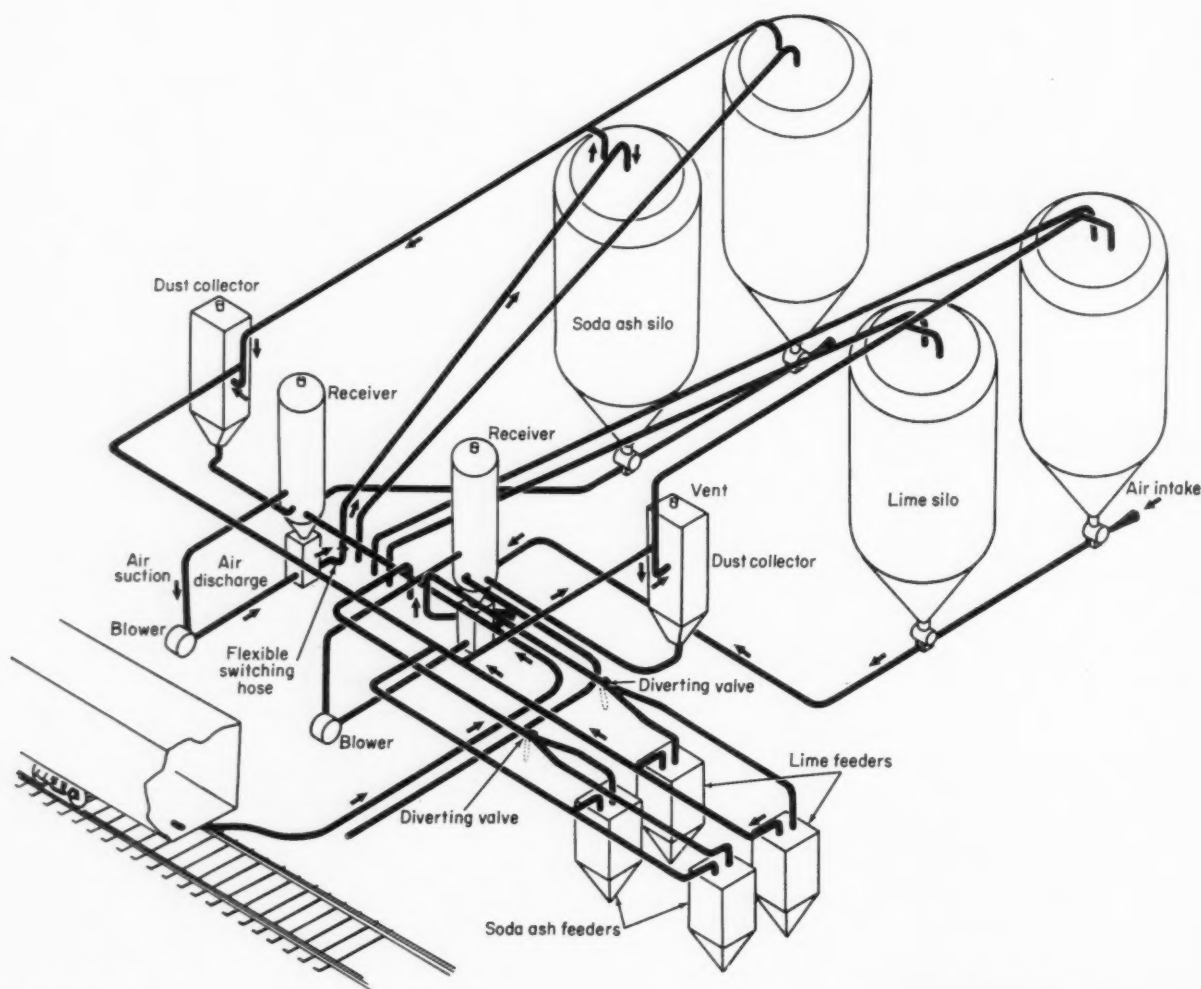
This table is a generalization. It is based on assumptions. If you need a conveyor longer than we have assumed, or if your material is the same in name but really differs in physical properties, then you may need a different conveyor. Use the table to get started in the right direction, but for the final answer use the help of a man who has wide experience with all sorts of pneumatic conveyors. ♦

Table II—FIND YOUR MATERIAL OR ONE LIKE IT HERE, AS A GUIDE TO PICKING A PNEUMATIC CONVEYOR

MATERIAL	FAN SYSTEM	MED. VELOCITY	DENSE STREAM	FLUID SOLIDS	AIR ACTIVATED GRAVITY
Alum		x			
Alumina				x	x
Aluminum Oxide				x	x
Arsenic Oxide		x		x	
Asbestos Dust	x	x			x
Barites				x	x
Bauxite		x		x	x
Beet Pulp, Dried	x	x			
Bentonite		x			x
Borax		x	x	x	
Calcium Carbonate		x	x	x	x
Calcium Phosphate				x	
Carbon, activated		x	x	x	x
Carbon Black			x	x	x
Catalysts, Petroleum		x		x	
Cellulose Acetate	x	x			
Cement, Portland				x	x
Cement, Raw Materials				x	x
Cereals		x	x		
Cerelose		x	x		x
Clays		x	x	x	?
Coal, Pulverized				x	x
Coffee Beans, green		x	x		
Corn Grits		x	x		
Cottonseed Meal		x	x		x
Detergent Powders		x		x	x
Diatomaceous Earth		x	x	x	x
Dolomite				x	x
Feed Ingredients		x	x		
Feeds, soft	x	x	x		
Feldspar				x	x
Fertilizers		?	?	?	?
Flaxseed		x			
Flint				x	x
Flour		x	x		
Fluorspar				x	x
Fly Ash				x	x
Fuller's Earth		x	x	x	
Gluten Meal		x	x		
Grains		x	x		
Graphite		x		x	x
Gypsum		x	x	x	x
Lime, Hydrated		x	x	x	x
Lime, Pebble		x			
Limestone, Pulverized				x	x
Magnesium Oxide		x	x	x	x
Malt		x	x		
Milk, Dried		x	x		
Mineral Wool	x				
Ores, Pulverized				x	x
Petroleum Coke					x
Phosphate Rock, Pulverized				x	x
Polyethylene		x	x		
Pyrites				x	x
Resins		x			
Rice		x	x		
Rubber, Crumb	x				
Rubber, Pellets		x			
Salt		x			
Salt Cake		x			?
Sawdust	x	x			
Seeds		x	x		
Semolina		x			x
Silica, Pulverized				x	x
Soap Ingredients		x		?	?
Soda Ash, Light		?	?		
Soda Ash, Dense					
Sodium Bicarbonate		x	x		x
Sodium Phosphates		x	x	x	x
Sodium Sulphite		x			?
Starches		x	x	x	x
Sugars, Refined		x	x		
Talc		x	x	x	x
Titanium Dioxide		x	x		
Wood Chips	x	x			
Wood Shavings	x				
Wood Flour	x	x			
Zinc Oxide		x	x	x	x

While the above is a good guide for the type of material to be conveyed, it is by no means the ultimate answer. As stated previously, amount to be conveyed, length of conveying line and arrangement of the conveyor will have a definite bearing in the final choice. Particle attrition will also dictate applicability.

Pneumatic system cuts chemical costs 22%



Fuller Co.

DUAL PNEUMATIC conveyors save spectacularly because they permit bulk purchase, and make handling easy. Manual work is reduced to control operations, such as placing hoses at A, turning valves at B.

AIR CONVEYING cuts chemical costs 22% for a Manitoba water treatment plant by permitting bulk purchases. Two side-by-side pneumatic systems handle lime and soda ash. The systems take the material from railroad cars to storage silos, then from the silos to the treatment process. The two systems are identical, and principal components of each are blower, receiver, and dust collector. Movement of materials from

car to receiver and collector to receiver is by vacuum. Storage silos are filled under positive pressure, emptied by vacuum. An important feature of the systems is a switching arrangement, employing hoses put in place by hand. This allows selection of silo to be filled, and also makes it possible to use both systems at one time for hurry-up handling of one material. Manual valves select the process feeder bin to be filled. ♦



The Systems Approach is the subject of this Project Upgrade article, third in a series planned to help you meet your growing responsibilities in the field of MATERIAL FLOW MANAGEMENT

Material control from the systems viewpoint

By E. RALPH SIMS, JR., Consulting Editor

"SYSTEMS APPROACH" is a term applied to many fields of technology and management. In considering the material handling function, the systems approach is a useful discipline for you to follow as material handling engineer or manager. In this application it can be defined as:

The consideration of material handling, plant layout, and packaging problems as a part of the total system of moving material, product, and paperwork from source to consumer, into, through, and out of the manufacturing and distribution system.

Apply Systems Approach

The first step is to understand the business system as a whole. In dealing with in-plant handling which involves material from vendors or packages for customers, the material handling engineer must go beyond that portion of the system which lies within his scope in the factory. He should interview his company's salesmen, and if he can, visit customer facilities. He should discuss the vendor's material with purchasing personnel, and if possible visit vendors' plants.

His aim is to gain a thorough understanding of the storage, handling, packaging, transportation, and traffic problems involved in delivering the raw materials to his plant, and in delivering the plant's finished product to customers. Through full understanding he may open the door to significant savings for his company, and at the same time he may benefit his customer or his supplier. It is also possible that he may find opportunity for savings in his supplier's plant which, though not otherwise affecting his own company, will permit a lower delivered cost for the product his com-

pany buys. Similarly, improvements in material handling practices in his own plant may help a customer save in his plant, this can strengthen the sales position of the material handling man's own company, even though it does not necessarily reduce its operating cost.

Recognize Management Objectives

An essential of the systems approach is the engineer's recognition that his objectives are those of management, that a performance improvement may not show up in the area where the problem is solved, but may result in a net profit improvement in other areas, and for the company as a whole. As a material handling engineer you might say, "this is fine, but my boss doesn't know anything about sales or purchasing. I report to the Factory Manager, and all he's interested in is his factory. If it doesn't pay off in the factory he says 'no'." This is often so, and your only recourse lies in better salesmanship, patience, and hope. If you give up, seek another job! Any manager so shortsighted that he doesn't recognize an improvement because it doesn't show up in his own department is not worthy of the title *manager*.

Problems Cross Department Lines

The promotable material handling engineer or material handling manager must recognize how his decisions influence other functions of the company. He must be capable of identifying and solving problems created in or by material handling which affect other functions. He must understand problems created by or in other functions which affect material handling.

PROBING QUESTIONS

...for applying "Systems Approach"

Here are some typical questions, suggested by the SYSTEMS APPROACH as explained by Ralph Sims. You will think of many more, applicable to your company's operations.

Ask your suppliers—

Can he ship material in a form that helps—

Receiving?

Unpacking?

Inspection?

Storage?

Use in Process?

Can he reduce time lag between our order, and delivery, so we can reduce inventory?

Can we liberalize our packing or shipping specifications slightly, thus save supplier money, and get a lower price?

Can a change in our supplier's invoicing methods reduce our paperwork costs?

Find out from your purchasing people—

Do our specifications insure our getting shipments in form, package, and quantity suited to our most economical mode of operation?

Do our receiving and inspection practices fit purchasing department needs?

Is our inventory control good enough to keep the cost of emergency buying as low as possible?

Ask yourself—

Can we increase productivity by getting material control paperwork out of the plant and into the office?

Can we change an operation from intermittent or batch to continuous or cycle, and thereby increase productivity?

Can we test a proposed improvement by trying it out with leased equipment?

Can we test it as a system by programming it on a computer?

Discuss with accounting—

Do we have data needed to analyze costs of material handling and control?

If not, what steps must we take to get these data?

Are we using the most efficient methods to give the accounting department data on receiving, inventory, shipping?

Traffic department questions—

Are there any changes in our packaging and handling methods that can reduce our shipping costs?

Are we making maximum use of free services carriers offer, such as advice on packaging and dunnage?

Do conditions on our shipping docks, and the handling of paperwork there, promote best relations with carriers and get their cooperation?

Check with marketing & sales—

Do we receive long-range sales forecasts which can help us control inventory and operations?

Have we done all we can to make our packages, delivery schedules, etc., help sell our product?

Interview customer to find out—

Do we understand customers' requirements for packaging and labeling our products?

Do our invoices, bills of lading, packing slips suit his requirements?

Can we, at no extra cost to us, ship in a container which customer can profitably re-use?

He must be able to sell his solutions for these problems to colleagues in other departments and divisions whenever his solutions will help them, or whenever a modification in their ways of functioning will help him.

A basic element in application of the systems approach is the coordination of engineering, management, operations, and just plain "brainwork" between departments and between the vendor, the company, and the customer. The purpose of this coordination is to arrive at a total solution which will benefit all. Often a solution which benefits the system as a whole requires an increase in operating costs in some segments of the system. Unless the systems approach is applied in explaining this type of solution, it will be rejected.

See the Big Picture

The increasing complexity of integrated material handling systems, integrated data processing, traffic and packaging procedures, etc., make it more and more necessary to adopt the systems approach to material handling problems. Frequently a solution to a problem may entail an increase in operating cost or a long write-off of an investment. This is balanced by an ultimate saving for the company, or by an advantage in terms of customer relations or purchasing costs. The whole picture must be examined and the economics analyzed in all cases.

The systems approach to material handling involves purchasing, inventory management, in-process flow, production control, plant layout, finished goods inventory, accounting, traffic, packaging and marketing, shipping, customer relations, product development, and long-term corporate planning. The material handling engineer must be cognizant of the existence of these relationships. He may not, for organizational reasons, be familiar with or have access to information on all these areas. Nevertheless he must recognize the possible implication of these other fields, and should ask questions (through proper channels, if necessary) which will lead to an answer to his problem. If management recognizes these implications, and the scope of the problem is broadened to include examination of these other areas, then right solutions are more easily reached.

At the very least, if the material handling engineer recognizes these factors, the breadth of his thinking will be drawn to the attention of management, and his growth will be accelerated. The systems approach will make his solutions to problems better; the improvement in company activities should result in his personal advancement.

FOR FURTHER READING

ORGANIZING FOR EFFECTIVE SYSTEMS PLANNING, SPECIAL REPORT No. 12,—American Management Association, 1956.

SYSTEMS & PROCEDURES—Victor Lazzaro, ed. Prentice-Hall, 1959.

SYSTEMS & PROCEDURES RESPONSIBILITY—Philip H. Thurston, Harvard University, 1959.

SYSTEMS ANALYSIS FOR EFFECTIVE ADMINISTRATION—Funk & Wagnalls, 1951.

How to make use of the systems approach

As Ralph Sims has explained in the foregoing discussion of the systems approach, your application of this concept can be very important to your personal advancement. We suggest that you bear certain principles in mind, and take some specific actions to benefit fully from the systems approach.

● **Regard your business organization as part of a single, integrated machine.** This machine extends from the raw materials source to the consumer, and according to the systems idea, everything possible is done to make each part (of which your company is one) fit properly with the parts which go before and come after. Generally the needs and desires of the ultimate consumer have the strongest influence in determining the pattern of the system. The form and availability of the raw materials are often the second most important influence on it.

● **Note that every part of a system contributes to results, but some parts perform intermittently, or as controls.** Business systems don't work like a train of cogwheels, with every component working simultaneously. They function more like the electrical systems of automobiles, which have generators, lights, and other units working only as needed, according to automatic or manual controls. These parts are balanced to work together, in capacity, amperage, and voltage.

You can carry this comparison with electrical circuits further, and notice that there is a flow of materials in one direction, toward the consumer, and counterflow of money in the opposite direction. There is also a parallel flow, like induced current, of information—chiefly on paper—which controls the main flow of money and materials. Since your job is to make the main flow of materials go smoothly, you have to know the whole circuit. Then you can eliminate points of resistance on the main line, and get rid of eddy currents which interfere with the information flow.

● **Analyze your system part by part to understand why it works as it does.** You will find two phases requiring study. One includes machinery and equipment, linked together by material handling devices. This is familiar territory which you understand (see "Why Buy a System," MATERIAL HANDLING ENGINEERING, January, 1961). The other phase of the system is organization. It is a matter of people, their lines of authority and responsibility, and the communications between them. The communications system is mainly paperwork. There are data from accounting, as well as other reports and information pertaining to purchasing, operation, and sales. Comprehension of this paperwork makes it easier for you to understand what people are doing and why they reach their decisions. You see what information they are getting, and the use they make of it.

● **Make the system within your own company the first object of your study.** Even if equipment, organization, and policy seem simple, it pays to reduce them to diagrams, charts, and statements. Include paper flow. This will explain some of the policies and practical effects which grow out of the systems you serve.

● **Here is an example of how a system, material control requirements, and policy can mesh:** A particular company manufactures wooden furniture. Its system is set up so that no finished goods inventory is carried. This reduces capital investment and permits a lower-selling price. It also has these results:

1. The material handling man must keep goods moving directly from the end of the finishing line conveyor, through packaging, into semi-trailers. Every unit must ship within 8 hours. This is complicated by the fact that paint on freshly finished units is not completely hardened, and careful handling is required to prevent marring.
2. The purchasing agent must be careful to get paint which sets up as hard as possible in the low-bake equipment used; he can't afford to neglect quality, however tempting a price may be.
3. The salesman must sell this product on the basis of a time lead which permits manufacture, and he must be sure the customer will take delivery upon completion of manufacture.

In this case the salesman, the material handling man, and the purchasing agent might prefer a system allowing for a stock of finished goods. The purchasing agent could take advantage of those paint bargains he knows about. The salesman could get those accounts that want immediate delivery. The MH man would have an easier job of preventing jams at the shipping dock. But this change in the system would probably entail a change in price, which would also change the customers, the mode of selling, and the whole nature of the business.

Under this set of circumstances it is plain that the material handling man who understands the system will direct his efforts toward improvement in handling to protect the finish, and installing equipment at the truck dock to speed loading. He may also work through the traffic department to get better cooperation from carriers. He will not waste his time on proposals for stocking finished goods.

In your own work you will find that increased knowledge of your company's system as a whole helps you concentrate your efforts on improvements which fit the system. Your proposals are more readily accepted by management, and easier to put into effect.

● **Set up a definite schedule for mastering the system in your own company, its extension into the organizations of suppliers and customers.** Cover your own company department by department, then chief suppliers of materials and typical customers. Write out a list of probing questions for each department, like those we have given, so your interviews result in specific information. Be a good listener, too. Some responses will go far beyond the questions you ask, and reveal useful facts you had not thought of.

● **Study systems as a general subject.** Methodically collect information about the systems used by your competitors, and other companies. You will get facts, often piecemeal, from published articles, advertising literature, talks given at conventions, and from personal acquaintance with MH men in other companies. The system patterns used by others often suggest ways for improving your own. ♦

SOMETHING different UP THEIR SLEEVES

Take your pick of either the All-Purpose or Return Loop Sling — Roebling makes both. And both are made from Preformed "Blue Center" Steel Wire Rope with steel core. Both develop full catalog rope strength.

They are available as chokers and in single and multi-leg construction . . . with thimbles, half thimbles, hooks, shackles and swaged open and closed sockets . . . through your distributor or Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

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The Colorado Fuel and Iron Corporation



ALL-PURPOSE SLINGS

with Flemish rolled splice. This splice means *added safety insurance*. It is formed by opening up the end of the rope and laying it back so three strands pass around the loop in one direction and the remaining three strands and the steel core pass in the opposite direction. This *extra* measure of safety is the big feature of the All-Purpose Sling.

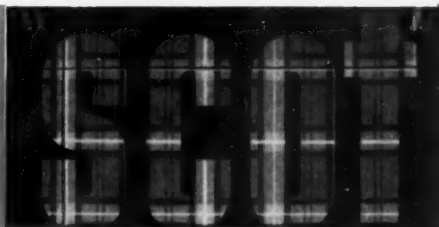
At the throat, all ends are secured under a tapered steel sleeve which has been squeezed around the rope with pressures up to 1500 tons.

RETURN LOOP SLINGS

The rope is bent back on itself to form the loop. A metallic sleeve is assembled over the end of the rope and the main body of the sling. Pressures up to 1500 tons are used to squeeze the sleeve in place.

This type of sling does a good job and costs less than the All-Purpose Sling. But it does not have the important added safety insurance that is built into the Flemish rolled splice.

Let the

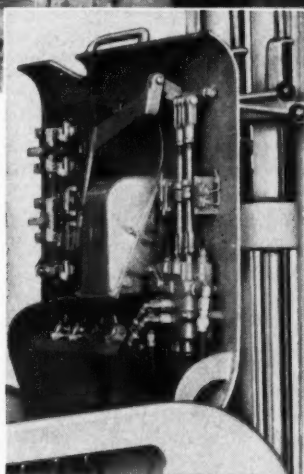


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**INCORPORATED
WILLOUGHBY, OHIO**



Circle 120 on Reader Service Card

Mechanized system breaks tradition

By **ORRIS L. DEAN**, Manager of Operations, Griffin Pipe Division, Griffin Wheel Co.

WE'VE ELIMINATED traditional handling of cast iron pipe at our Council Bluffs foundry. Result: manpower savings and better quality control.

Our plant, completed in March, 1960, marked the entry of Griffin into a new field. Our foundry handling methods are entirely new to the pipe industry.

- Other manufacturers remove the pipe from casting machines by gripping the bell end of the pipe and walking the machine away. Then an overhead crane picks up the pipe, deposits it on skid rails that feed into the annealing furnace.
We use a pipe extractor. It reaches into the mold, pulls out the pipe, automatically pushes it in front of lifting arms that gently lift the pipe on skids. Then it rolls into the channel that feeds the annealing oven.
- As far as we know, all cast iron pipe foundries transfer their pipe from line to another by overhead cranes or transfer cars.
We use a pipe conveyor.
- Other companies sort pipe for hydrostatic test with an overhead crane.
We have a Ferris wheel pipe sorter. It operates unattended, automatically sorts the smaller pipe on the bottom skid rail and the larger pipe on the top-rail. We can adjust the prongs to sort any diameter pipe from 4 to 12 inches.

Whole Process Is Conveyorized

Our plant extensively uses interlocking chain conveyor systems. By combining the pipe's ability to roll with modern conveyors, we quickly and safely remove 20-foot lengths of pipe from casting machines.

We convey the pipes through the annealing oven, transfer them between finishing lines, and automatically sort, inspect, and position them for palletizing. And never once through all these processes, do they leave the continuous conveyor line. By avoiding the overhead crane, we don't crack and warp the hot pipes.

Palletizing bundles of pipe substantially reduces our loading and unloading costs. We lift the pallets to flat cars or flat bed trailers with fork lift trucks and a self propelled hydraulically operated vertical lift carrier (a mobile gantry crane). Our customers tell us they've found it more economical to handle pipe shipped our way than to handle pipe that comes in on gondola cars or box cars. They like our loading procedure. We band each pallet separately, then band two pallets together. Then we band the pair to the flat car, or chain the pair to the trailer bed.

The Griffin System

We'll follow a 20-foot pipe from its whirling birth in

one of three centrifugal casting machines to its shipping place on a truck or rail car.

Immediately after the pipe length is cast, extractor jaws reach into the steel mold of the centrifugal casting machine. A compressed air cylinder expands the jaws so they firmly grip the bell end of the pipe. The air cylinder also pulls the pipe out about 1 to 2 inches, gently breaks the bond between the metal mold and the hot pipe. An endless chain propels the extractor carriage backward. As the hot pipe is removed, spool rollers support it at 6-foot intervals on the chain.

Four mechanical arms then automatically lift the pipe to skids. From the skids, it rolls onto the chain conveyor. The conveyor feeds the pipe to the weighing station and annealing furnace. Compressed air decelerators at intervals prevent bumping at high speed.

The Griffin extracting process is only a 2-cycle operation. This saves manufacturing time, and prevents excess wear on the casting machine's hydraulic system.

Pipe Keeps Rolling

Alloy steel fingers mounted on endless chain next push the pipes and convey them on upward pitched rails through a 105-foot-long annealing oven. The upward pitch forces the pipe to roll, not slide. Each pipe is plastic as it moves through the 1,760° F. annealing furnace. Sliding pipe would sag out-of-round because of its own weight.

As they leave the furnace, the pipes continue to move by the same power conveyor. Each length keeps rolling while it cools to 400° F.

Following annealing and cooling, the pipes transfer themselves to cleaning and finishing lines. As it rolls on to a transfer conveyor, each pipe trips a switch. This automatically starts the conveyor (a series of supporting saddles mounted on endless chain). At the end of the conveyor, a second switch stops the pipe, and at the same time, activates air-operated arms. The arms push each pipe onto gravity rails headed for cleaning, grinding, and testing.

If there's a break in finishing line operations, a mechanical arm moves the pipes directly from the annealing conveyor line onto surge rails leading to the plant yard. This prevents a shutdown of casting. When we again need pipe, we mechanically lift lengths back to the transfer conveyor and move them to the finishing line.

Pipes roll to either side of two sets of machines that automatically grind the insides. An operator, with only control buttons, controls a hydraulic cylinder. The cylinder powers pivoting arms for lowering pipe from the rails to rotating wheels. The wheels spin the pipe.

to cut costs

Grinding machines, positioned at each pipe end, complete the grinding. The pipe is raised to the rails automatically, and proceeds to the next station where grinders do touch-up grinding with portable pneumatic grinders and wire brushes.

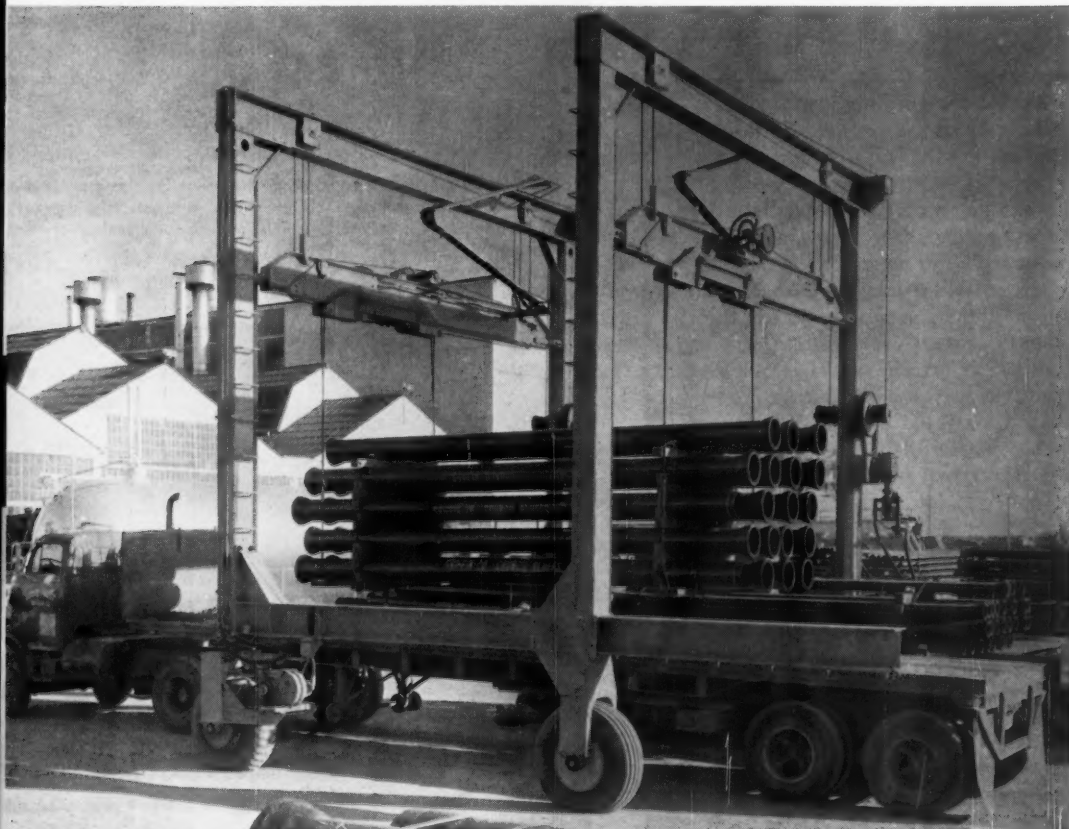
At the next station, the pipes are lowered on to powered wheel and rotate while the straight end is trimmed, if necessary, with a cut-off wheel. We bevel the outside edges as required with an easily positioned grinding wheel.

How The Ferris Wheel Sorts Pipe

After a hardness test, our Ferris wheel automatically sorts our pipe. The wheel has adjustable openings around its rim. As it turns, pipe with diameters of 4 to 12 inches simply move into slots. They sort themselves onto 2-level segregation rails headed for the hydrostatic test press. Large diameter pipes enter the



A SEVEN TON bundle of palletized 6-inch diameter pipe goes directly onto a railroad flat car by a 10-ton fork lift truck. Four lifts are required for a carload, and two lifts for a truckload. Palletizing has cut customer handling costs.



TWO PALLET truckloads of 20-foot pipes is easily lifted onto a flat-bed trailer truck by a 25-ton capacity lift carrier (mobile gantry crane). The carrier loads a railroad flat car in a two-lift operation.

slots only part way and the upper level rails pick them off.

At the end of the 2-level segregation rails, an air-activated elevator permits pipe from the upper level rails to roll across to a high pressure water tester. The elevator raises smaller diameter pipe from the lower rails, and feeds it into the hydrostatic tester. After each length is tested, it is fed back to the finishing line automatic air cylinder operated metering devices. Then a transfer conveyor carries the pipe to the next finishing line. Here, air cylinder operated metering equipment feeds pipe into and out of the cement lining machine, paint spray, final weighing, and stenciling.

Next, each pipe feeds into a pipe positioner. It automatically turns the pipe 90 degrees onto rails leading to the palletizing room. Lengths are alternately turned bell and plain ends to nest compactly in the pallets.

A side-loader fork truck carries nested pipe (three to eight lengths at a time depending on diameter) to palletizing stations. Standardized pallets consist of two tiers of pipe weighing five to eight tons depending on size. Four by four oak beams serve as bearing pieces. Steel strapping secures the pallet.

We think this table shows the economies of palletizing, how huge tonnages are compactly unitized.

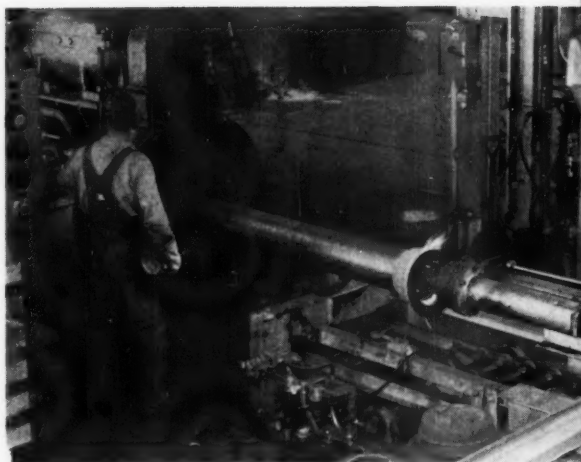
SIZE (Inches)	20-FT. LENGTHS PER PALLET	WEIGHT (Tons)
4	32	5
6	24	6½
8	18	7¼
10	14	6½
12	12	7¾

Fork lift trucks move all cement-lined pipe pallets to the cement curing bay. Here they're held 72 hours at even temperatures to provide maximum cement lining strength.

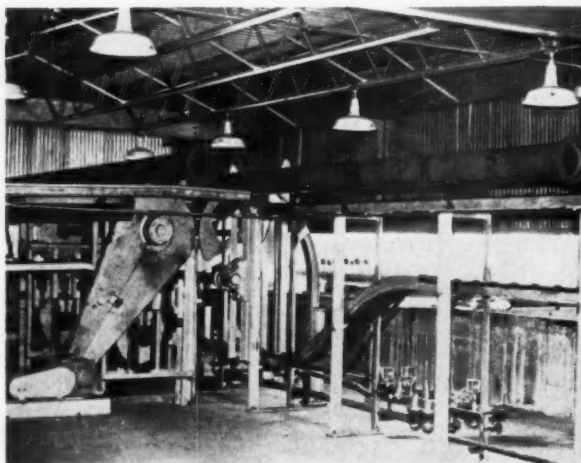
Ten-ton fork lift trucks move cured pipe pallets to the plant yard for storage or immediate shipment. Either the lift trucks or a 25-ton capacity lift carrier does the final loading of flat bed trucks or railroad flat cars. Trucks also position and stack pipe pallets in the loading area. This makes it easy for the mobile lift carrier to load waiting trucks or rail cars. The carrier straddles the flat bed trucks or railroad flat cars, loads a truck with one lift, and a rail flat car with two lifts.

Palletizing also makes it possible for lift trucks to quickly and easily unload and store a carload of pipe in four lifts. This has cut costs for pipe users. In addition, the overhead crane normally used for gondola unloading is no longer required. The pipe in flat bed cars can be unloaded with rope and skids.

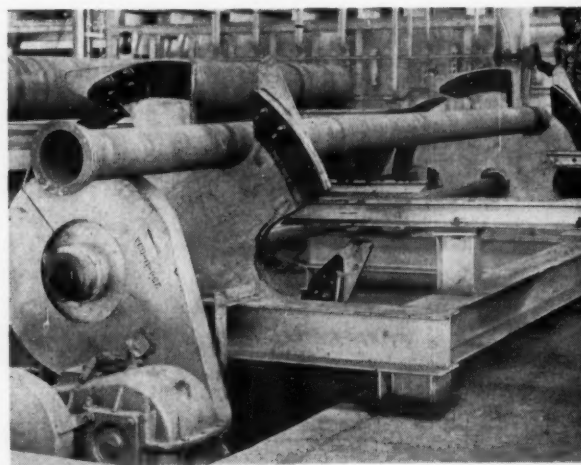
We have yet to receive our first complaint on broken pipe. We have also received favorable comments from customers as to the time saved in unloading over old methods. The pallets can be stored where most convenient, for movement to job site. This saves labor on unloading, and in subsequent reloading of pipe onto flat bed trailers for transportation to installation sites. The pallets are rugged enough to withstand this multiple handling. ♦



A RED HOT length of 20-foot cast iron pressure pipe is gently pulled from a centrifugal casting machine. By pressing a button on an electronic control panel, one man turns out the length, extracts it, and sends it on conveyors to the annealing furnace.

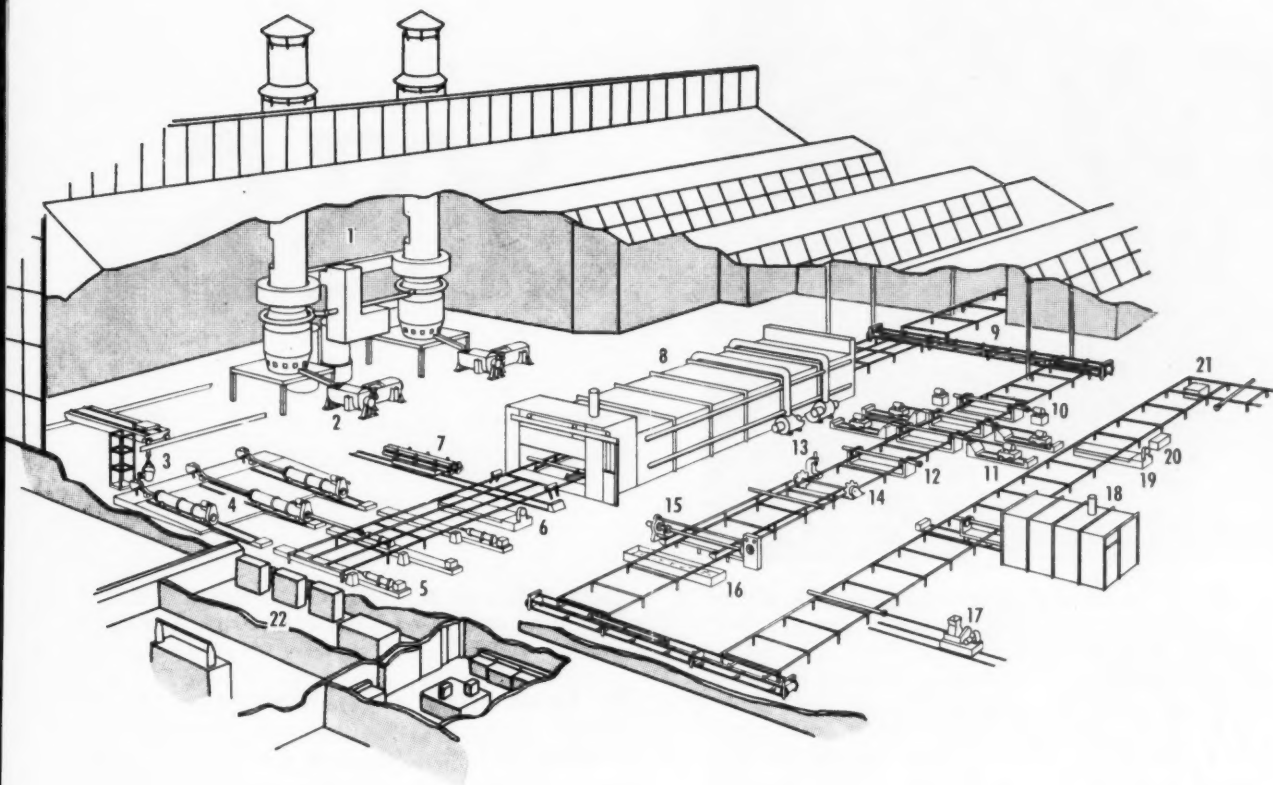


PIPE COOLED to 400°F. moves from the annealing furnace conveyor line onto a transfer conveyor. Limit switch automatically starts the transfer system. Pipe is moved to a finishing line for cleaning, grinding and testing.



AUTOMATIC FERRIS WHEEL sorts cast iron pressure pipe according to diameter. Large diameter pipe enters the slots only part way, is picked off by upper level segregation rails. Small diameter pipe sort itself onto lower rails.

PIPE HANDLING AT COUNCIL BLUFFS

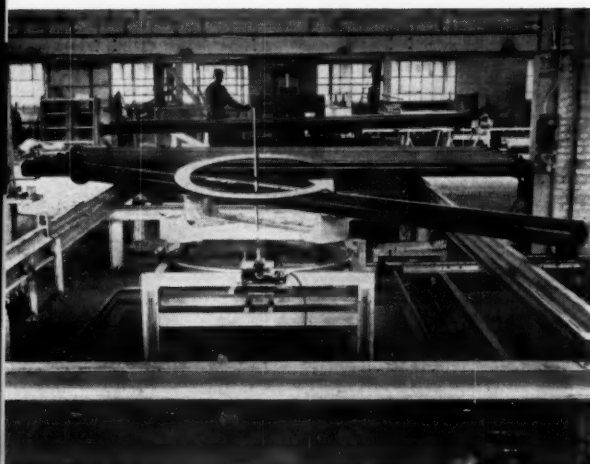


- 1. Griffin hot blast cupoles
- 2. Holding ladles
- 3. Transfer ladle
- 4. Delavaud casting machine
- 5. Pipe extractors
- 6. Weigh scale

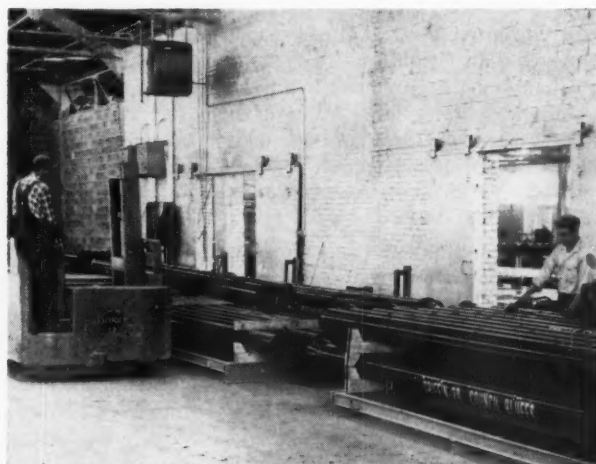
- 7. Transfer car
- 8. Annealing furnace
- 9. Pipe transfer
- 10. Bell and plain end grinders
- 11. Internal grinders
- 12. Cut-off machine

- 13. Brinnell hardness tester
- 14. Pipe sorter
- 15. Hydrostatic test press
- 16. Pneumatic test press
- 17. Cement liner
- 18. Paint booth

- 19. Weigh scale
- 20. Pipe stenciler
- 21. Direction positioner
- 22. Electrical control center
- 23. Quality control laboratory



FOLLOWING FINISHING and inspection, a length of pipe is automatically turned 90° by a pipe positioner and laid onto rails leading to the palletizing bay. They're turned alternately bell and plain ends to provide compact nesting.



FORK TRUCK deposits pipe at palletizing stations. Pallets are made up of two tiers of pipe weighing 5 to 8 tons depending on size. Four by four oak beams are used as bearing pieces. Steel strapping .035 x 1 1/4" is applied to secure the pallet.



Has LP gas

YES

By **JOHN DRAXLER**

chief engineer, Elwell-Parker Electric Co.

LP GAS CLAIMS often are inaccurate. They contain an element of truth. But the advantages are overstated. I think more and more fork truck users look at LP gas skeptically. There's less tendency to convert to LP gas just because someone says it's good.

LP gas for industrial trucks started with a push about six years ago. The petroleum industry began an intense campaign to sell industry on this byproduct of the gas fields and oil refining.

What About Fuel Cost Savings?

As a byproduct, LP gas was cheap. As the demand increases, however, the cost goes up. In some areas, users without bulk storage now pay about the same for LP gas as for gasoline.

We interviewed LP gas users, came to some conclusions based on 3,000-lb. trucks:

- With fleets of 10 trucks or less, the fuel cost per hour is the same for LP gas and gasoline.
- On larger fleets, LP gas may be 6 cents an hour cheaper than gasoline.

Changing LP gas tanks is a nuisance. It's awkward to use a cylinder large enough for a full shift. The driver often can't see around, or get to parts underneath, a tank large enough for an 8-hour shift.

Is LP Gas Safe?

The regulations and recommendations of major fire underwriting firms show LP gas is hazardous. The storage and handling of such a highly volatile fuel must be carefully controlled. There are rigid specifications for the maintenance shop and parking areas for LP gas trucks.

I feel safety is the biggest LP gas drawback. This can be lessened by controls and precautions. But workers get careless. Then you're in trouble.

I think there's a hazard from concentration of LP gas fumes inside a plant. Sure, air conditioning and

turnover dilute an accidental concentration. But how fast is the gas dispersed, especially when the air is dense?

The Smell—Help or Hindrance?

LP gas men help make their odorless product safer by adding ethyl mercaptan. It will burn completely if the carburetor is adjusted properly. But it's hard to keep it adjusted, mainly because of negligence. Result: an exhaust gas with a sickening odor, a gas that can irritate the eyes and nauseate.

LP gas may bleed from slight leaks in the fittings and disconnect couplings, which are handled countless times. Some plants don't repair or replace these until there is an obvious leak. This may be natural, but it's worth a thought when considering LP gas.

Does Maintenance Really Cost Less?

Many converted to LP gas because they were sold on reduced maintenance costs. They were willing to put up with hazards, inconvenience, and extra cost of conversion equipment. They discovered, however, that the savings were not so great as promised.

You may even pay a penalty for LP gas. For example, some industrial truck maintenance organizations charge more for LP gas contracts. They say they

Continued on page 74

Where they agree, sort of . . .

The two authors included some thoughts on fuel cells, although they were off the subject of LP gas. You can see how people are thinking in the power field.

A fuel cell changes chemical energy into electrical energy inside the cell. (See "Fuel Cells—Almost Here" in the July issue of MATERIAL HANDLING ENGINEERING).

been oversold?

NO

By JOHN J. ROSE

president, Propane Industrial Service Inc.

LP GAS WILL DO what we claim if you use it right. But like many useful things, it's only as good as the effort you put into making it work properly.

I've seen LP gas installations that didn't work well. But there always was a reason and it could be corrected. My advice: if you install LP gas in industrial trucks, do it right; go all out. Even better: get good professional help.

Is LP gas worth the effort? I sell to a highly satisfied 600 factories. Where you can use a gasoline truck, you can use LP gas. On the other hand, some applications favor electric trucks or diesels over LP gas. We do no service trying to push LP gas in these cases.

Fuel Costs Less

There are savings, but you must figure them fairly. For example, compare LP gas *bulk storage* with gasoline *bulk storage* and you find LP gas costs less.

Or compare LP gas *in cylinders* with filling a gasoline truck *at the pump*. The cylinder load costs more than a like amount of gasoline. But, no one refuels a gasoline truck for less than \$2 a crack. That's taking in the cost of gasoline, overhead, time lost, labor, etc. Compare this with the 15 seconds it takes to exchange a cylinder of LP gas and it still is cheaper despite container cost.

Rose called the fuel cell ideal for industrial trucks. He predicted that the most practical fuel cell will use propane and oxygen. Rose worked on the fuel cell principle when he was a student at Massachusetts Institute of Technology.

Draxler ventured that the fuel cell will arrive in about five years. He figured the most practical one will use oxygen right out of the air. The big drawback right now, he said, is trying to develop a cheaper anode.



The Big Bugaboo: Safety

I have yet to find a safety engineer who could tell me why he thinks gasoline is safer than LP gas. This attitude is widely accepted. But it seems to be entirely in the mind, unrelated to facts. The records show that LP gas is safer than gasoline. But, every time there's an LP gas fire or explosion, it appears on Page 1 of the newspaper. Figures tell us that more than 55 percent of the industrial fires in the U.S. are caused by gasoline lift trucks and improper gasoline handling.

The caution toward LP gas is good, I think. Workers treat it with respect and care. After all, you're more careful picking a rose than a daffodil.

LP gas is safer for several reasons. It's carried in tanks at least 50 percent stronger than gasoline tanks. This protects against ruptures from collisions. There's no oxygen in an LP gas tank. So it's impossible to have flashback and a confined explosion. There's no danger from accumulation of spilled LP gas. Liquid propane becomes a gas when released from a tank, disperses in 15 to 20 seconds at most at normal temperatures.

Smell It at Once

There's some alarm over leaks in a sealed LP gas system. A small leak is not dangerous and you'll know it at once from the unpleasant smell of an additive called ethyl mercaptan. It takes only 50 cc. to odorize a 10,000-gal. tank of gas.

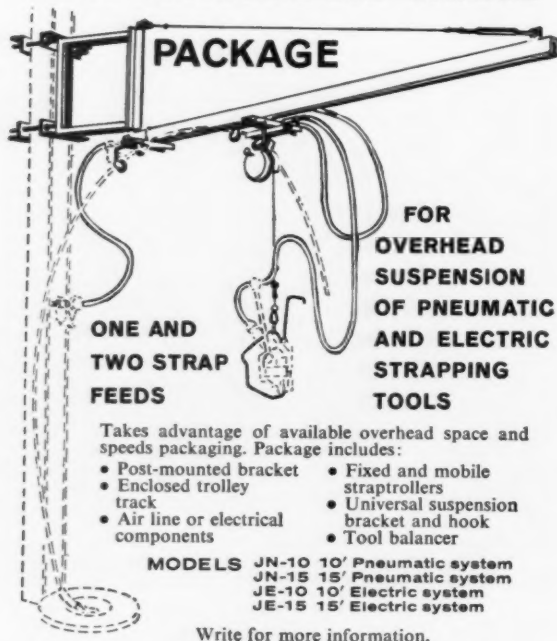
The additive never burns completely. It's the only source of odor in pure propane. If an excessive odor is present in exhaust gas, your carburetor mixture may be too rich, engine timing off, or there may be a leak. Your factory mechanics should know how to cope with these. That's why our company hires first rate technicians to educate the mechanics.

Maintenance Advantages

An LP gas engine needs much less general main-

Continued on page 74

NEW SIGNODE JIB CRANE

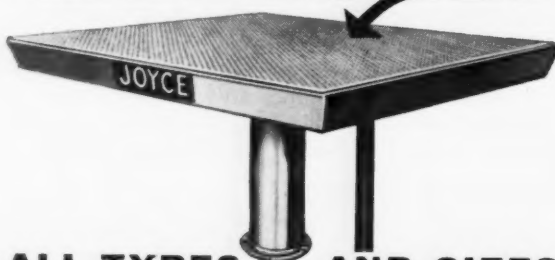


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Circle 141 on Reader Service Card

HAS LP GAS BEEN OVERSOLD?

YES

need more skilled mechanics, that it takes more trips to the plant to adjust equipment.

You hear a lot about longer oil life with LP gas. We estimate savings of about 2 cents an operating hour on crankcase oil for LP gas over gasoline. This is almost insignificant.

There's major maintenance on an engine-powered truck whether it's gasoline or LP gas. Accessory equipment, such as transmission, water pump, cooling system, generator, starter, voltage regulator, distributor, and exhaust system, may account for more than half the maintenance. The LP gas system itself needs constant maintenance. There's a filter, primary regulator, vaporizer, final regulator, carburetor, and automatic valves on the fuel system.

True, LP gas engines don't need as frequent major overhauls. But then the accessory equipment needs more frequent inspection, probably offsetting the savings. As one maintenance manager said: "It's doubtful that you can save enough on maintenance alone to justify the added cost of an LP gas-equipped truck."

Our figures show that overall the large LP gas fleet may save 13 cents an hour over gasoline for each truck. The small fleet with fewer than 10 trucks saves only 7 cents an hour. But, for LP gas, they may spend up to \$400 a truck for conversion equipment and they may have to modify their maintenance shop and parking area and provide LP gas storage. ♦

NO

tenance that a gasoline engine. An LP gas engine has a simple carburetor, no fuel pump. LP gas, free of the gummy additives found in gasoline, burns cleaner.

The oil lasts up to 25 times longer. Is this significant? Well, consider: lower oil costs, less downtime, less mechanics' time, fewer filter changes, and less engine wear. LP gas just doesn't dilute and contaminate the oil. We change oil in our own trucks once a year. Then we analyze a sample. It's clean enough to go right into a gasoline engine.

But use common sense. If you run your trucks in a dirty atmosphere, like a foundry, then you must change oil oftener.

LP gas provides savings through fewer major overhauls. One aluminum company runs its engines 13,500 hours before major overhauls. This compares with 3,500 hours for gasoline engines. An insulation and floor covering manufacturer found fewer snapped axles, less tire wear when it switched to LP gas trucks. The firm discovered this was due to smoother power surge from LP gas, less shock in starting up.

LP gas became an important source of industrial truck power around 1955. The growth has been steady. At first, we were laughed at. But we offered free trials, and time proved LP gas is a good fuel.

True, some plants have changed back to gasoline. But 95 percent of these became dissatisfied because they tried shortcuts. Those who use LP gas properly remain satisfied, often delighted, customers. ♦

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can bring you:

1. Up to 4 times greater storage capacity in the same area.
2. Manpower savings up to 70%.
3. 100% selectivity.
4. Increased handling speed and safety.
5. Overall reduction in warehousing costs.

CHICAGO TRAMRAIL CORP.
TRAK-RAK CRANE

This Trak-Rak Crane system, recently installed at Samuel Son & Company, Toronto, is one of approximately 300 Trak-Rak installations at work today. Operating efficiently and with an absolute minimum of maintenance, these Trak-Rak installations have solved many coil, sheet, palletized material and order picking problems.

Learn how a TRAK-RAK Crane can help you.

Write for details and new Bulletin TRC-102.

**Pioneers in the
stacker crane field**

121



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Series H-Capacities
from 6000 to
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EUCLID HOISTS

for Dependable Service

These hoists are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

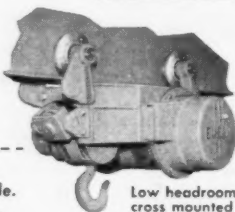
The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusually compact, rugged and accessible hoist readily adapted to various installations and types of control.

Various other standard and special heavy duty hoists available. Write regarding your requirements.



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Literature

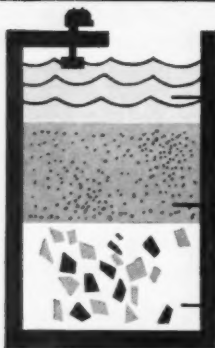


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Circle 137 on Reader Service Card

No-damage shipping with inflatable dunnage

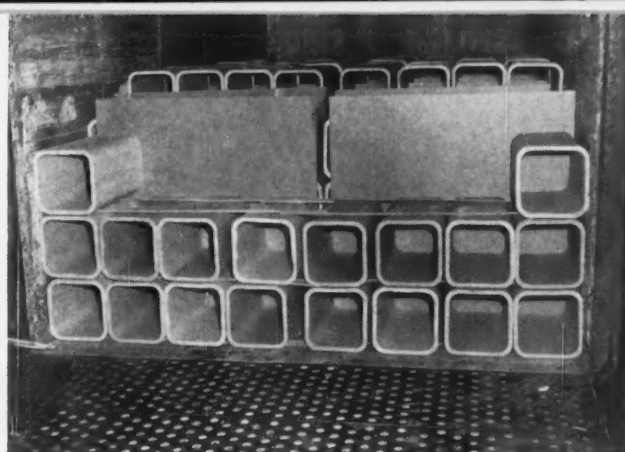
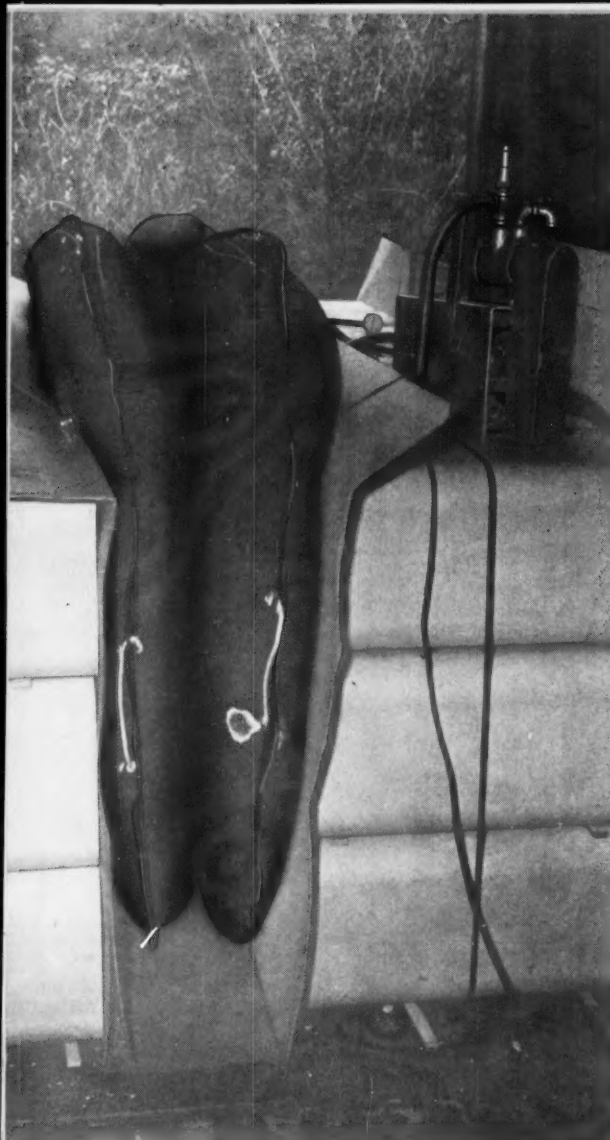
STRAITSVILLE BRICK Co. has jumped on the inflatable rubber dunnage band wagon. Little wonder when you examine the shipping record. With wood bracing, it isn't unusual for 5 percent of a load to wind up damaged, losses up to \$50 and inconvenience to the customer. With inflatable dunnage, many a load comes through without even one broken piece.

"The rubber dunnage has really done a job," Shipping Superintendent John Dunkle told an MHE editor. "Oh, the first cost, \$65 a bag, is considerable. But the bags will pay for themselves in a few years, maybe sooner."

This company is at New Straitsville, Ohio. It makes chimney flue liners and ceramic heating pipes. It turns out 100 tons of liner a day, tries to ship that much. Most shipping is by rail boxcar.

Using the Feather Touch

Flue liner usually comes in 24-inch lengths, but in various cross sections: 13 x 13, 13 x 8½, and 8½ x 8½ (all in inches). Workers handle the liner on 42 x 36-



INFLATED to 6 psi, the rubber dunnage (left) moves the flue liners several inches. Ordinarily (top) the liners are stacked with nothing more than slats and corrugated between them. The standard pallet load (bottom) takes 16 of the 13 x 13-inch tiles.



inch pallets. They get 16 of the 13 x 13 on a pallet; 25 of the 13 x 8½ on a pallet, and 36 of the 8½ square on a pallet.

Palletizing is done carefully by hand. Small pneumatic-tired fork trucks carry the pallets into the boxcars. Two workers stack the liners inside the boxcars. They lay small wooden slats between each layer of liners and stand large sheets of corrugated between each stack.

The boxcars hold 36,000 lb., 544 pieces of 13 x 13 flue liner. Loading a boxcar takes three men about two hours, one on the fork truck and two inside the car. Inserting the inflatable dunnage takes another half hour. The old system of wood bracing takes 1½ hours.

The Dunnage in Place

Workers leave about 6 inches between the final two stacks of liner. In the gap, one man inserts the rubber dunnage, two 4 x 4-ft. bags and two 4 x 5-ft. bags. This fills out the 9-ft.-wide car.

Then he inflates the bags to 6 psi, which exerts

nearly 10,000 lb. of thrust toward the front and rear. The bags wedge the load, but provide shock resistance because of the air cushion.

Along with the load go the empty dunnage boxes. When the load arrives, the customer deflates the bags, rolls them up, and returns them in the original boxes. Usually, there's no charge for the return trip.

Other Shipping Methods

The company uses rubber dunnage only when the customer asks for it. The firm hasn't bought enough bags to take care of all customers. Therefore, the firm still uses wood bracing in some shipments.

It also uses a floating system which protects against breakage but costs more. Liners are loaded on skids and tightly bound with steel strapping. Corrugated sheets go between skid loads. Workers leave 2 ft. at each end of the car and 8 ft. in the middle. The skids just sit on the floor, held by nothing but the weight of the load. This can be considerable; one piece of 13 x 13 weighs 67 lb. ♦

ELPAR ...engineered to



SAVE on operating costs

Elpar trucks deliver your loads when price-tag trucks fail. They cost less to operate... give more years of economic life on any job.

Only Elpar combines so many special features in a standard truck. To get the performance you pay for, let Elpar carry the load!

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Drive unit is custom-built by Elpar. The "heart" is Elpar's own motor, engineered specifically for heavy truck duty. Drive unit mounted on truck centerline to balance load, equalize tension on drive shafts. Permits "center sill" construction... more frame strength. Optional gear ratios, motor sizes give choice of drive... to increase starting torque, boost speed, cut power drain.



Typical Elpar drive unit has worm and wheel primary reduction. Greater load-carrying ability, quiet, long-wearing. Induction hardened steel worm, phosphor-bronze worm wheel centrifugally cast for high density. Four-pin differential carries heavier loads. Wheels mounted on tapered roller bearings. Hydraulic brakes applied to wheel drums.

For more information on Elpar trucks, write for this booklet—"Building A Quality Product"; then call your Elpar representative.



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TWICE THE LIFE...ONE THIRD THE OPERATING COST



How they're handling . . .

LUMBER

C. C. RHODES LUMBER Co. at Charleston, S.C. sells lumber and building supplies. It delivers unit loads of lumber directly to building sites. The result, says Rhodes, "We get new customers and keep old ones happy."

The company makes on-site deliveries with a fork truck. It easily travels rough terrain with loads weighing as much as 6,000 lb.

Rhodes says contractors like this service for many reasons:

- They can stack the loads in the sequence the carpenters will need the lumber.
- Losses due to pilfering are smaller because the loads are banded with steel strap.
- The strapped loads are more compact. There's no lumber scattered around.
- The compact loads are easy to cover and protect from the weather.
- The unit loads are easy to inventory as they're being delivered.

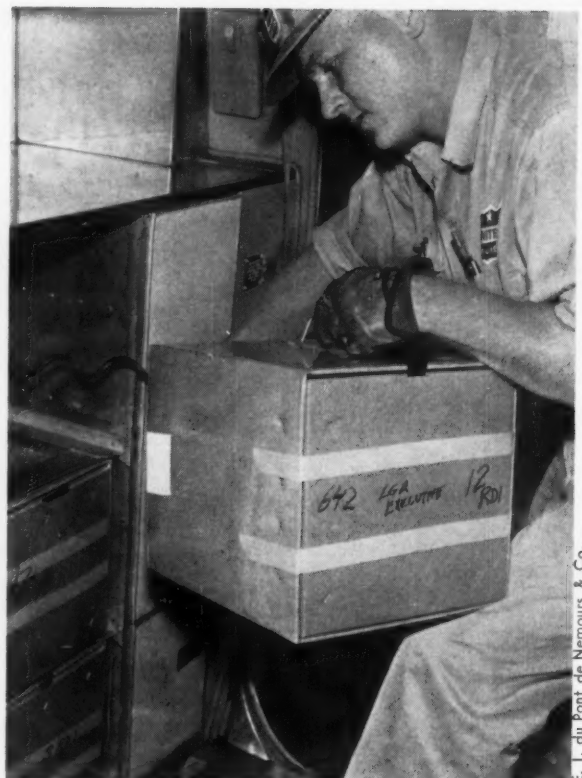
With a Ranger 60, a truck driver and fork truck operator can unload a semitrailer containing 16,000 board feet of lumber in 30 minutes. It used to take a truck driver and two men at least 6 hours when they handled the lumber manually.

FOOD

TO SERVE YOU A HOT MEAL, United Air Lines has adopted a new returnable corrugated kraft fibreboard hot food container. It has a life expectancy five times that of the old containers.

The difference? The outer layer of the corrugated structure is a laminate of one-mil Mylar polyester film and standard 69-pound kraft.

This container keeps food hot and clean during its



E. I. du Pont de Nemours & Co.



Clark Equipment Co.

trip from kitchen to plane. The container measures 11½" high, 11½" wide, and 13¾" deep. The container, comprising an outer shell and inner liner of corrugated paperboard, covers an aluminum heating unit and tray holder. One end is removable, allows the loading and unloading of four trays.

Six container loads are used on the line's DC-6's and DC-7's, hold hot food for 72 people. The heating element socket is at the back of the container. This makes it easy to plug into electrical fixtures on standby racks in the kitchens and on airplanes.

For several years, the airline used an unprotected paperboard container. But replacement costs were high. The boxes became unsightly within a few trips. The handlers couldn't wash soiled surfaces. And moisture from spills, rain, or wet sinks made the box look unsanitary and actually made it disintegrate.

The Mylar polyester film cured all these ills. Its high resistance to abrasion reduced the scratching and tearing. Flight number crayon marks easily clean off.

United says the multiple protection offered by the film increased the life of the average food service container from 15 trips to 75 trips.

RUBBER SLABS

A POWER-AND-FREE-CONVEYOR SYSTEM transports large rubber slabs through a water spray tunnel at Vernay Laboratories, Inc. of Yellow Springs, Ohio.

Vernay is well pleased with the system. In planning it, they knew that the size of the slabs meant several restrictions. The carriers have to be stationary when loaded; the slabs of rubber could not touch each other in the tunnel; and only loaded carriers go through the tunnel.

The illustration shows slabs of rubber emerging from the tunnel after being sprayed. They will be unloaded as they round the turn. The empty carrier then completes the turn, and is pushed up to the free line accumulation area (upper right).

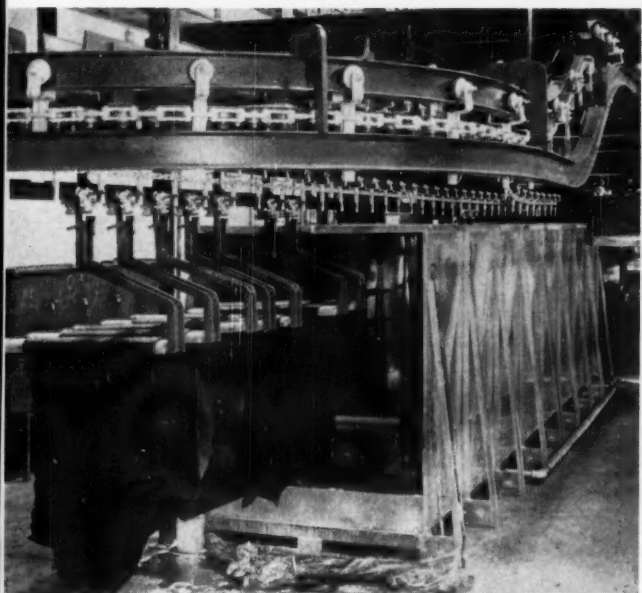
PEOPLE

THIRTY SCOOTERS and Trucksters transport men and material around the 237-acre Camden, N.J. works of New York Shipbuilding Corp.

Because of its great size, the works maintains its own rail system. It also has trucks for transporting heavy material. To take some of the burden off this transportation system, the scooters and Trucksters are used to deliver items needed in a hurry. The carriers are important to New York Ship's maintenance, plant engineering, and general stores departments.

The maintenance department has to keep 76 widely scattered buildings in tip-top condition. This does not include the 5 covered ship-building ways, outfitting basin, covered wet slip, and dry dock. A maintenance man may have to go to one storeroom for paint, to another for cable, and then take the material to the job. The Truckster enables him to work quickly and cheaply because it goes 50 miles on a gallon.

They take maintenance men to and from their jobs in a hurry. Of the 30 trucks, 15 are equipped with personnel carriers. And while they're designed primarily for transporting men, they can also haul supplies. You only have to lift out the seat and lower the tail gate.



The Rapids-Standard Co.



Cushman Motors



PACKAGING & SHIPPING IDEAS

Slipboard system saves for case and keg shipper



ELEVATOR in racking room speeds palletizing.



KEGS go into trucks tiered 3-high.

Douglas Fir Plywood Association

SAVINGS OF \$100,000 A YEAR through a planned MH system are paying for an improved keg and case handling system developed by an Oregon brewer.

Rising costs spurred Blitz-Weinhard Brewery, Portland, to hunt a better method of handling kegs. After analyzing their needs they decided that handling cases and kegs with a single pallet system would cut cost.

They then began shopping for a readymade pallet suitable for both kinds of container. Finding none, Blitz-Weinhard designed and patented pallets and slipboards that do the job.

The distinctive feature is a simple means of holding kegs in place. There are holes in the deck of each pallet and in each slipboard. Keg ring bands fit snugly into these recesses like eggs in an egg carton. The 32 x 40-in. pallets have 4 holes, to accommodate 4 kegs. In other ways the pallets are of standard 4-way pattern, made of 3/4-in. exterior plywood. They are used like ordinary pallets to carry cases.

Kegs are handled tiered, 3-high when full, 9-high empty, and the upper tiers are held in place by the slipboards. These are 28 x 36-in. rectangles of Douglas fir plywood pierced with holes matching those in the pallets. They are notched on 2 sides, so they do not flip when the last keg is rolled off at the notch. The slipboards are exterior type 2.4.1 plywood 1 $\frac{1}{2}$ thick.

This system saves four ways. The brewery no longer needs a special keg shipping crew. In the wash house and racking room they now operate with two less men. Twice as many kegs can be stored because pallets and slipboards make it possible to stack higher. Damage to kegs is reduced sharply; they don't slam around in trucks or tumble off stacks as they did before.

Trucks can carry larger loads.

The new method is safer, and customers like it. Several Blitz-Weinhard distributors have been so pleased that they have begun to use the pallets and slipboards themselves, and they report savings like the brewery's.

Another first from Standard Conveyor

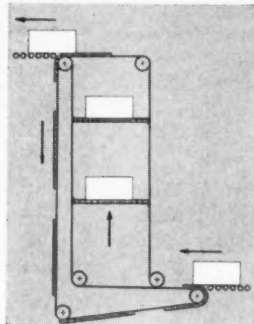
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How Escaveyor saves space. Escaveyor lifts packaged or unit commodities rapidly from floor to floor with the continuity of a belt conveyor. Yet your product always rides level. And look at the huge saving in space! It takes even less floor space than a conventional monostrand or straight-lift conveyor! Escaveyor's size is tailored to fit your package.

How Escaveyor costs less. Escaveyor actually costs less to purchase and install than practically any other type of lift. It requires less manpower because no manual loading or unloading is required. You also save many square feet of valuable floor space.



Free brochure. Send for free Escaveyor brochure! It tells how Escaveyor works, and how it can solve vertical material handling problems for you! Get your copy from Standard Conveyor Company, Dept. 302-D, Second St., North St. Paul 9, Minnesota, or from your nearby Standard Conveyor sales representative.

*patent pending



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BULLETINS CATALOGS FILMS

Helps You Build Conveyor Systems

"FMC Conveyors" pictures and describes standard conveyor components you can use to produce engineered system. Includes straight and curved roller sections, mountings, drives, rollers, bearings. Gives plans for assembly of components into system.

Food Machinery Corporation

Circle 401 on Reader Service Card

Wire Mesh Baskets, Tubes

Wire baskets and tubular wire containers for toting, stacking, storage, and also for processing, (plating dipping, etc.). Bulletin B-10 shows standard and special designs, meshes and wire cloth from which baskets are made.

Newark Wire Cloth Company

Circle 402 on Reader Service Card

Illustrated Motor Line

All Louis Allis motors illustrated, briefly described in 8-p. Bulletin 2651. Includes squirrel cage motors from $\frac{1}{4}$ to 2500 hp., gearmotors, DC motors, wound-rotor motors, synchronous induction motors, alternators, generators, and associated controls.

Louis Allis Co.

Circle 403 on Reader Service Card

Scale for Lift Trucks

Hydraulic scale attaches to any fork lift truck. Weighs accurately to $\frac{1}{2}$ of 1 percent of scale capacity. Six models, capacities 1000 to 6000 lb. Catalog 161 pictures installation method, gives prices.

Hydroway Scales Inc.

Circle 404 on Reader Service Card

En Masse Conveyor

Sixteen-page booklet explains why Tube-Veyor can make sharp bends and twists in various planes. Tube-Veyor is suitable for granular materials, chips, liquids. Diagrams show installation layouts, pictures reveal details of drives, double-clevis chain used, other components.

Prab Conveyors, Inc.

Circle 405 on Reader Service Card

Slotted Angle Shelving

New slotted angle shelving presented for first time in 100-page general catalog. (No. 100-K) covering all Lyon products for industry.

Lyon Metal Products, Inc.

Circle 406 on Reader Service Card

Makes Boxes as Needed

Compact Rite-Size Corrugated Box Maker slits, scores, prints, slots in one operations. Handles single or double wall sheets to 400 lb. test. Makes boxes from 3 x 3 x 3

to 36 x 18 x 18, either tape joint or stitch flap. Change dimensions in 90 seconds. Revised catalog gives full information on production rates, operation.

Colt Packaging Machinery Co.

Circle 407 on Reader Service Card

Capsule Caster Catalog

By using tabular format, Rapistan gives information on 5 series of casters in postcard-size, 16-p. Catalog 1750. Series range from general duty (60 to 600 lb. capacity) to heavy duty (500 to 2400 lb.). Beside giving usual dimensions, specs., manufacturer ticks off those models considered "best buys."

The Rapids-Standard Co., Inc.

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Good Title Done In

Lured by the title, we paid our \$3 for "The Distribution Revolution" by Walter Hoving, chairman of Tiffany's (published by Ives Washburn, New York). Whatever may be said for Mr. Hoving's distribution revolution, he's not having the same one now altering physical distribution. He deals with fashion, "the principle of self-consumption," compulsory competition, bank checks, salesmanship. Our advice: if you too are tempted, read a few chapters in the bookstore before you buy.—J.F.S.

Electric Trucks

Broadside presents "Hustler" electric lift trucks, personnel carrier, and utility truck. Describes features, drive, hydraulic system, gives specifications for lift trucks.

The Heifred Corporation

Circle 409 on Reader Service Card

Uses of Tape

How industry uses pressure sensitive tape for protecting, sealing, holding, packaging shown in photos. Also dispensing and applying machines, table of physical properties for various kinds of tape, in Folder P-MNF(1202) P.I.

Minnesota Mining & Manufacturing Co.

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Robots, Real & Proposed

With photos to show what they have done, drawings to suggest what they can do, General Mills breathes out a little Year 2000 A.D. atmosphere in describing mechanical hands and manipulator-equipped vehicles. Catalog describes man-size robot hands, conventional vehicular

Continued on page 87

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401	413	425	437	449	461
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Cleveland 15, Ohio

Card Invalid Without Company Name

APRIL 1961, Do not use after July 15, 1961

NAME		TITLE	
COMPANY		KIND OF BUSINESS	
ADDRESS			
CITY	STATE	ZONE	

ADVERTISERS															COST															
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Do you wish to continue to receive MATERIAL HANDLING ENGINEERING each month ☐ Yes ☐ No

BULLETINS CATALOGS FILMS

manipulators of type used in steel mills, and shielded, remote-controlled, or sealed track-laying types for use in clearing radiation-contaminated debris or for working at bottom of deep bodies of water.

Nuclear Equipment Dept., General Mills
Circle 411 on Reader Service Card

Screw Feeder Performance

Data on how fast screw feeders handle each of 456 dry, bulk materials given in 8-p. booklet. Furnishes name of material, density, screw size, rate of delivery (lb/min.) and a figure indicating uniformity of delivery rate.

Vibra Screw Feeders, Inc.
Circle 412 on Reader Service Card

Inspection Scales

Direct reading of over- or under-weight, in fractions of ounces or decimals of pounds, possible with new scale design. Fits procedures set forth by Bureau of Standards Handbook 67. Two models, 5-lb. and 20-lb. capacity, described in Bulletins 3439 and 3440.

Exact Weight Scale Co.
Circle 413 on Reader Service Card

Clear-Span Pole Building

Pole-and-truss type buildings cut material and erection cost for warehouses up to 50%, according to folder from Koppers. Spans from 24 to 50 ft., side-by-side additions make wider buildings. Gives dimensions, roof and wind loads, other data.

Koppers Company, Inc.
Circle 414 on Reader Service Card

Movies of English Diesels

An English manufacturer offers two films on Diesel engines. "The Six 354" tells of the development and production of a new 6-cylinder direct injection 112 bhp transport diesel (Black and white, 16 mm, sound, 17 minutes). The other, "Why the Diesel? — No. 1., The Vehicle Operator" explains the advantages of diesel-engined vehicle operation (Black & white, 16 mm, sound, 10 minutes). To obtain, address Perkins Film Unit, Perkins Engines Ltd., Peterscourt, Peterborough, England.

Product Guide

Guide from American Chain & Cable tells buyers ACC makes wire rope, push-pull controls, cable assemblies, power & chain hoists, traveling cranes, bomb and missile handling equipment, positioning control systems, other products, as well as chain.

American Chain & Cable Co., Inc.
Circle 415 on Reader Service Card

Low Headroom Hoists

Compactness, low-headroom dimensions, steel load-bearing structure featured as standard design for R. & M. Type F electric hoists. Capacities from $\frac{1}{2}$ to 10 tons,

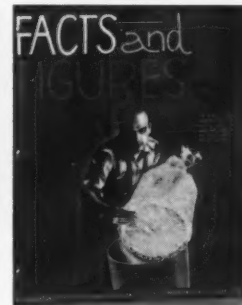
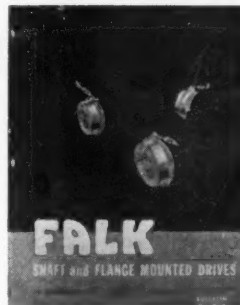
available with manual or motor-driven trolleys. Bulletin 920 tabulates full specifications.

Robbins & Myers, Inc.
Circle 416 on Reader Service Card

Shaft and Flange Mounted Drives

Selection data, dimension drawings given for all Falk Shaft and Flange Mounted Drives, in Bulletin 7100. Classification table shows which types are suitable for various kinds of conveyors and elevators.

The Falk Corporation
Circle 417 on Reader Service Card



Plastic Bags, Liners, Films

"Facts and Figures" provides data on plastic film liners for drums, cartons, etc., bags, and covers. Shows in pictures how to insert and close liners. Table summarizes properties of films made from various plastics.

Protective Liner Corp.
Circle 418 on Reader Service Card

Corrosion-Resistant Motors

Construction that make motors resistant to corrosive and abrasive conditions explained by handsome 4-color cut-away pictures. Motors are open type, for ventilation, but have encapsulated stators, coated rotors, double-seal bearings. Bulletin 05-51B90.

Allis-Chalmers
Circle 419 on Reader Service Card

Electric Powered Cotton Compress Truck

The model F45T is designed to provide fast, safe, and dependable bale handling under the severe and constant use encountered in this industry. A 4-page brochure details this electric truck, gives complete specifications and detailed drawings.

The Elwell-Parker Electric Co.
Circle 420 on Reader Service Card

Feeders and Rotary Valves

Bulletin F-5A covers the company's line of roll and vane-type feeders and rotary valves. The feeders, built of cast iron, or iron and steel combinations, are designed to handle dry pulverized, and granular materials. Bulletin includes descriptions of the various types of feeders.

Fuller Company
Circle 421 on Reader Service Card

Bagging 60 Tons an Hour

Photographs in 8-p. folder show how automatic bag-filling machine packages 400 to 500 tons of free-flowing material a day. Examples include chemicals, feeds, fertilizers. Accuracy is plus or minus 4 oz. per 100 lb.

Kraft Bag Corporation
Circle 422 on Reader Service Card

Continued on page 89

For Fast Carloading

Whenever you want to move material fast—especially in close quarters like a boxcar—Moto-Trucs can do the job better.

They're tough, yet so simply constructed they seldom break down. Everyday servicing is easy too. Result: Your Moto-Trucs stay on the job longer . . . cost less to maintain.

Moto-Truc offers the world's most complete line of walkie trucks . . . all priced substantially below competitive models.

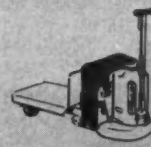
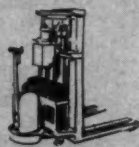
... use
MOTO-TRUC



The MOTO-TRUC Company

12403 TAFT AVENUE • CLEVELAND, OHIO

*Largest Exclusive
Manufacturers of
Walkie Trucks*



BULLETINS CATALOGS FILMS

Holdback Clutch Data

You'll find every fact you need to know about Formsprag Holdback Clutches in 12-page catalog. (Holdbacks prevent reversal of inclined conveyors.) Includes engineering data, selection worksheets, mounting information, maintenance, prices.

Formsprag Company

Circle 423 on Reader Service Card

Stacking Pallets

Because BG Stacking Pallets are custom made, they can handle a wide range of objects, from crockery to coils of steel. How to order pallets to fit your product shown in Bulletin No. 283.

Bernard Gloekler North East Co.

Circle 424 on Reader Service Card

Carton Stapler Saves Space

Four-page folder describes Space-Saver stapling machine. Holds 10,000 staples. Increases carton closing production.

International Staple & Machine Co.

Circle 425 on Reader Service Card

Collapsible Transport Tanks

Rectangular collapsible tanks have rubber liners supported by aluminum or steel walls which fold in like an accordion. Capacities 850 and 2,900 gal. Suitable for most liquids, beverages. For highway, rail, and ship transport. Illustrated booklet describes construction, specifications, use.

B & W Enterprises, Inc.

Circle 426 on Reader Service Card

Vibrating Feeder

Natural frequency vibration used for handling rock and ore. Amplifrol drive, exploiting natural frequency, cuts power requirement. Has remote control. Bulletin C900P.

Carrier Div., Chain Belt Company

Circle 427 on Reader Service Card

Crane-Excavators

All Series "350" Bantam crane excavators described in 12-p. bulletin No. 350-2. Specifications, features, attachments, for 11-ton carrier-mounted and self-propelled models, 8-ton crawler unit.

Schild Bantam Company

Circle 428 on Reader Service Card

New Electric Fork Truck

Features of Lectro-Lift are new carbon pile continuous range speed control, welded counterbalancing frame. Dual hydraulic pumps for fast hoist, quick tilt. Has 54-in. turn radius, can handle 36 x 36-in. load in 90-in. aisle. Capacity 1 ton. Bulletin C760 brings complete performance data.

Lectro-Lift

Circle 429 on Reader Service Card

Vacuum Lifting

Airlock's 12-p. catalog describes vacuum lifting units (vacuum pads with integral pump, ready to hang on hoist hook), vacuum transfer machines, pump power packs, and vacuum pads. Tables list capacities of components.

Airlock Mfg. Co.

Circle 430 on Reader Service Card

Tubular Conveyor

One-page bulletin describes use of tubular (en masse) conveyor to return collected sinter dust from electrostatic precipitators to sintering machine.

*Conveyor Div.,
Hapman Corporation.*

Circle 431 on Reader Service Card

Data on Asbestos Ducts

Reprint of article includes data on pressure drop in air moved through asbestos ducts. Figures suggest MH uses, such as dust return lines on pneumatic conveyors.

Johns-Manville Corporation

Circle 432 on Reader Service Card

LP-Gas Conversion Kits

Table in 6-p. folder tells which Met-R-Flo kit to order to convert selected makes and models of industrial and lift trucks to LP-gas. Folder also shows kit contents, and charts typical performance of engine after conversion.

American Liquid Gas Corp.

Circle 433 on Reader Service Card

Three-Stage Lift Truck Masts

Triple-stage uprights for Clark lift trucks permit high stacking, lower minimum height. Specifications given in 2 bulletins: SS-1771 covers 2000 to 5000 lb. models; SS-1772 for 6000 to 8000 lb. models.

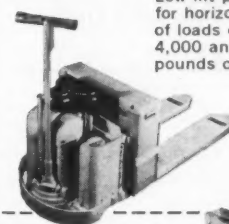
Clark Equipment Company

Circle 434 on Reader Service Card

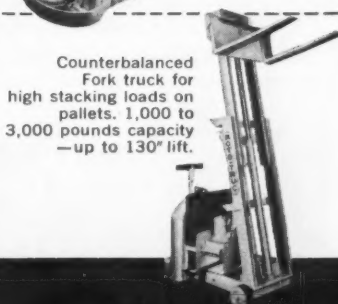
Conveyor Belt Selector

Belts for food and package handling described in 12-p. booklet.

Continued on page 90

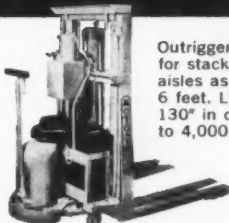


Low lift pallet truck for horizontal handling of loads on pallets. 4,000 and 6,000 pounds capacity.



Counterbalanced Fork truck for high stacking loads on pallets. 1,000 to 3,000 pounds capacity — up to 130" lift.

MOTO-TRUC Walkie Trucks



Outrigger pallet truck for stacking from aisles as narrow as 6 feet. Lift to 130" in capacity — to 4,000 pounds.



Tractors for all towing jobs with draw-bar pull to 700 pounds. Models to handle trailers, live or semi-live skids.

Write for free Moto-Truc "walkie" catalog... ask for Bulletin No. 36W.



World's Largest Manufacturer of "Walkie" Trucks

The MOTO-TRUC Company

12403 Taft Ave., Cleveland 8, Ohio
Circle 80 on Reader Service Card

BULLETINS CATALOGS FILMS

Selector chart rates various types of belts for resistance to abrasion, extreme temperature, oil and grease.

B.F. Goodrich Company

Circle 435 on Reader Service Card

Conveyor Limit Switch

Double pole single throw switch, heavy duty construction, rated at 15 amps, 125 v. Dimensions given in 1-p. bulletin.

Edon Industrial Products

Circle 436 on Reader Service Card

Packaging Fragile Products

Tricks of the trade in packaging fragile products given in special issue

of Hinde & Dauch Package Laboratory News.

Hinde & Dauch Div., West Virginia Paper and Pulp Co.

Circle 437 on Reader Service Card

Exhaust Purifier

Eleven case histories tersely told in word and picture explain how Oxy-Catalyst fume reducers permit use of gasoline or LP-gas powered equipment in enclosed areas.

Oxy-Catalyst, Inc.

Circle 438 on Reader Service Card

Door Operators

Electrically powered, air-operated Air-Lec units for sliding, swinging, folding, and freezer doors. Four-page bulletin, ST-61, gives mounting drawings, air requirements.

Schoelkopf Mfg. Co., Inc.

Circle 439 on Reader Service Card

Loader Has High Lift

Pictures and diagrams of Lull Loaders in 4-p. folder explain why these big front-end loaders have high lift (13½ ft.), long reach (6 ft.) extra maneuverability with optional 4-wheel drive. Capacity 5 tons. Complete dimensions and specifications given.

Lull Engineering Co.

Circle 440 on Reader Service Card

MH System for Supermarkets

How to set up a handling system for supermarket merchandise, using pallets, lift trucks. Analyzes each operation from receiving to stocking shelves. Discusses costs. Illustrations of recommended pallet, appropriate trucks included in Industry System Analysis 541-4.

Lewis-Shepard Products, Inc.

Circle 441 on Reader Service Card

MTC Hydraulic INVERTING and UP-ENDING EQUIPMENT

MODEL UP
Metal coil or roll paper up-ender — down-ender. Portable or stationary. 1 to 10 ton cap.



MODEL SPI
Sheet pack inverter, book type 5 ton, 10 ton, 20 ton capacity.



MODEL PI
Paper pack inverter, floor level loading. 2000 to 6000 lb. cap.



Hydraulic TRUCK ATTACHMENTS

MODEL CS
Clam scoop for fibrous and granular material. 10 to 25 cubic foot capacity.



MODEL HBO
Drop bottom box operator installed with forks for pallet and box handling. 1000 to 6000 lb. cap.



CARTON CLAMP
1000 lb. capacity



MATERIALS TRANSPORTATION CO.
5429 W. Diversey Ave., Chicago 39, Ill. • Berkshire 7-7701

Circle 75 on Reader Service Card

THE MOST IMPORTANT 18 INCHES

You have an 18" bottleneck at the beginning and end of your material handling system.

*Source: Truck-Trailer Mfg. Ass'n.

The 18" at the loading dock . . . between the lowest trucks and highest trailers serviced*. Rail cars offer similar problems.

Kelley Adjust-A-Lip Dockboards provide the permanent answer. They adjust perfectly to every carrier . . . give you extra speed, extra safety, extra production every time a load moves in or out!

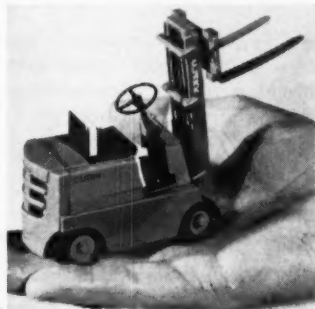
KELLEY COMPANY, INC.

MATERIAL HANDLING ENGINEERING

90

Lift Truck Model

Plastic model accurately represents 4000-lb. capacity Clark



truck. Mast and forks move. To obtain, send \$1.00 to Sales Promotion Department, Industrial Truck Division, Clark Equipment Co., Battle Creek, Michigan.

Adjustable Speed from AC

Bulletin "Adjusto-Spede Drives" explains how Eaton Dynamatic eddy current principle produces infinitely adjustable speed from AC current without motor generators, rectifiers, or rotating electrical contacts. Also describes electronic or transistorized controls. Construction of drive shown clearly by cutaway. Dimensions given for units with capacities from 1/2 to 15 h.p.

Dynamatic Div.,
Eaton Manufacturing Co.

Circle 442 on Reader Service Card

Vulcanized Fibre Equipment

Spaulding catalog tells how material handling problems are solved by vulcanized fibre containers and equip-

ment. Includes conveyor containers, storing, palletizing, shipping, dunnage.

Spaulding Fibre Company, Inc.

Circle 443 on Reader Service Card

Tailgates Lift and Lower Loads

Hydraulically powered tailgates for trucks and trailers. Five basic designs (9 series), and also a combination power and dump gate. Catalog PG-

6005 shows how to install and use these gates, PTO and electric powering, all specifications.

Young Spring & Wire Corporation

Circle 444 on Reader Service Card

Wheeled Front-End Loader

Long reach, open design for visibility and safety are features of Caterpillar 922 Series A Traxcavators.

Continued on page 92

FAST, LOW-COST HANDLING
OF SMALL AGGREGATE AND ANY
FREE-FLOWING MATERIAL

BAUGHMAN MODEL 210

INCLINED ELEVATOR

Spaced Buckets on Belt
Any Length from 20 to 60 Feet

Here's a light-duty but extremely durable elevator for fast handling of any free-flowing, non-sticking material.

Custom assembled to your requirements in any length from 20' to 60', buckets from 11" to 15" x 6" x 6", power facilities from 5 h.p. to 7 1/2 h.p. Prefabricated sections permit money-saving on-the-job assembly by your own crews, if you prefer.

For Complete Information
Write for Bulletin A-392



BAUGHMAN
MANUFACTURING CO., INC.

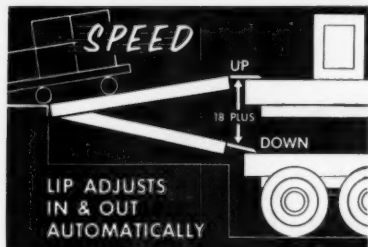
315 SHIPMAN ROAD JERSEYVILLE, ILL.

Circle 15 on Reader Service Card



6111

IN YOUR DOCK OPERATION!



**"PIONEER AND WORLD'S LARGEST MANUFACTURER
OF ADJUSTABLE DOCKBOARDS"**

If you have (or are planning to build) a loading dock you'll want new facts on how to break the dock "bottleneck" once and for all . . . quickly and at low cost. Write for the Kelley "Profitable Dock Planning Kit."

**FREE DOCK PLANNING KIT
MAILED TO YOU ON REQUEST.**

Includes dock layout recommendations i.e.: aisle, canopy, driveway requirements, current trailer restrictions, etc. Check your requirement:

- ☐ REMODELING KIT
☐ NEW CONSTRUCTION KIT

Tear out and attach this coupon to your letterhead. Sign your name and mail to:



**KELLEY
COMPANY, INC.**

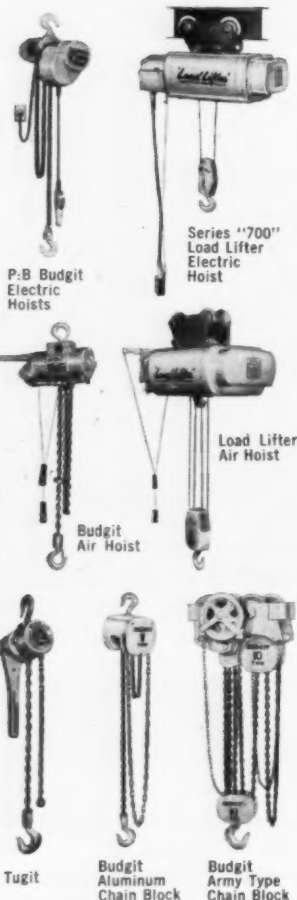
2139 W. MILL ROAD
MILWAUKEE 9, WISCONSIN

Circle 66 on Reader Service Card

Lifting Made Easy

HOISTS AVAILABLE FOR EVERY
LIFTING JOB

- 1 ✓ **ELECTRIC HOISTS** for frequent lifting with pace setting speed
- 2 ✓ **AIR HOISTS** to lift fast where atmosphere conditions are hazardous, corrosive, extremely hot, dirty or wet
- 3 ✓ **CHAIN BLOCKS** for easy lifting where the work cycle is moderate



ELECTRIC HOISTS

P:B Budget® Electric Hoists. 1/8 to 2 tons. Modern push-button hoists for regular service. Portable. Two fully enclosed automatic brakes. Spotting action is fast, accurate. 1/2-ton load can be lifted at 34 FPM. Hook suspension. Trolleys available. Standard models for intermittent service — AC, DC, and 12-volt battery types — have pull cord control.

Load Lifter® Electric Hoists. 1/2 to 15 tons. For heavy-duty and production line service. Safe 24-volts at the push button. Single and 2-speed control. A ton can be lifted at 60 FPM. Two automatic brakes. Types for lug or hook suspension; also with push, hand-gear or motor-driven trolley. Hi-hook model increases length of lift.

AIR HOISTS

Budget® Air Hoists. 1/4, 1/2 and 1 ton. Compact, lightweight hoists for regular lifting service. Link and roller chain types. Explosion proof motor. Spark and corrosion resistant link chain models. Speeds infinitely variable to 75 FPM. Pull cord control. Safety hooks standard. Rigid mount type and push trolley available.

Load Lifter® Air Hoists. 1 to 15 tons. Wire rope type for heavy-duty service. Five cylinder motor for smooth operation at all speeds. Speed infinitely variable to 37 FPM. Pull cord control standard; throttle control available. Mechanical load brake adjusts itself. Lug, push trolley, and hand-gear trolley suspension.

CHAIN BLOCKS

Tugit® . . . the Lever-Operated Hoist. 3/4 to 3 tons. Light. Compact. Portable. Operates easily at any angle even in close quarters. Has countless uses in every industry. Spur-gear for highest efficiency. A 42-lb. pull on the handle lifts 2 tons. Spark and corrosion resistant models.

Budget® Chain Blocks. 1/4 to 10 tons. For production or maintenance. Combine light, strong aluminum frame with spur-gear lifting and automatic load brake. 25 lb. pull on hand chain lifts 1/4 ton. Hook suspension standard. Trolleys available. Army-type Budget has integral trolley that can be adjusted to fit several sizes of I-beams and permits high hook lift. Ask about spark and corrosion resistant models.

SOLVE YOUR LIFTING PROBLEMS. Call your nearby Shaw-Box Distributor for practical help in selecting the best type of overhead load handling equipment — hoist or crane — for each task. Or, write us for literature.



OVERHEAD LOAD HANDLING EQUIPMENT

Products of

MANNING, MAXWELL & MOORE, INC.

Shaw-Box Crane & Hoist Division • Muskegon, Michigan

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario.

Circle 74 on Reader Service Card

BULLETINS CATALOGS FILMS

Exerts 13,700 lb. break-out force. Booklet 34004 gives specifications, construction details, dimensions, attachments and accessories.

Caterpillar Tractor Co.

Circle 445 on Reader Service Card

Quiet Motorpump

Folder on new high speed, low noise level motor pumps includes selector chart. Covers requirements from 15 to 500 g.p.m., heads from 20 to 110 ft. Dimensions, mounting data.

Ingersoll-Rand Co.

Circle 446 on Reader Service Card

Mechanization in Terminal Warehouse

Use of mechanized and automatic equipment in highway freight terminal. Bulletin 34 gives details as case history with diagrams, pictures to show system and equipment.

Jervis B. Webb Co.

Circle 447 on Reader Service Card

Live Roll Conveyor

End drive conveyor for light packages or small unit loads. Intermediate rolls may be free or driven. Details in Data Sheet EP2560.

Conveyor Specialty Co.

Circle 448 on Reader Service Card

Gummed Labels Stay Flat

Proof that "Prone" gummed label stock stays flat is offered by 8-p. folder—folder is printed on gummed "Prone," does stay flat. Includes samples, prices.

Kalamazoo Label Company

Circle 449 on Reader Service Card

Wire Pallet-type Containers

Four-page folder shows construction features, types, full specifications of standard size and junior wire-mesh "Palletainers." Offers free trial.

Union Steel Products Co.

Circle 450 on Reader Service Card

Land-based Cargo Container Cranes

"Dravo Dockmaster Containers Cranes," Bulletin 248 cites general advantages of two types. Pictures and descriptions of both. For use where containers move directly be-

Continued on page 94

MATERIAL HANDLING ENGINEERING

IT'S BOUND TO BE BETTER WITH



STEEL STRAPPING TOOLS

New air-powered tool speeds strapping of boxcar parts at Pullman-Standard

There is no more burdensome hand-operated strapping done at Pullman-Standard division of Pullman Incorporated. They now automatically flat strap steel boxcar flooring and steel compartmentizer doors with the new USS pneumatic Model 7300 stretcher. A slight twist of the control knob on this heavy-duty machine automatically stretches strapping to a pre-set tension. Result: A tighter, more compact bundle with no shifting or damage in transit.

The portable Model 7300 is built for long service, little upkeep. It's lightweight, simple to operate. With the Model 7300, you can have a uniform strapped package every time. There's no repackaging because of loose straps. This automatic machine can unitize and palletize any size shipment faster and better than any previous method.

Learn how the Model 7300 can upgrade your strapping operation. For more information, send the coupon.



**U. S. Steel Supply
Division of
United States Steel**



U. S. Steel Supply
U. S. Steel Corporation
208 South LaSalle Street
Chicago 4, Illinois

Please send me more information on the new automatic USS Model 7300 Stretcher

Name

Company

Address

City Zone State

Circle 129 on Reader Service Card

Just off the plane and HERE COMES YOUR LUGGAGE



Luggage-claiming area at United Air Lines' bright new terminal at New York's Idlewild International Airport.

AN AIR TRAVELER'S DREAM COME TRUE!



You have just stepped off a plane with 100 other jet-age travelers, and already a high-speed belt conveyer system is delivering your luggage to the claiming counter. The traveling diverter is distributing the luggage evenly along the rail, and all of you will be on your way, with your luggage, in a matter of just a few minutes. This system of belt conveyers is a good example of **Outstanding Performance**—the extra you get in Mathews Conveyers.



MATHEWS CONVEYER COMPANY
GENERAL OFFICES ELLWOOD CITY, PENNSYLVANIA
PACIFIC COAST DIV. MATHEWS CONVEYER COMPANY WEST COAST,
SAN CARLOS, CALIFORNIA
CANADIAN DIVISION . MATHEWS CONVEYER COMPANY, LTD., PORT HOPE,
ONTARIO.

MATHEWS

Over Fifty Years of Leadership in Mechanized Handling

Circle 81 on Reader Service Card

BULLETINS CATALOGS FILMS

tween ships and railcars or truck trailers and where containers move between ships and a storage area beneath the span of the crane. All-welded traveling structures of man-trolley design. Lifting capacities up to 30 tons.
Dravo Corp.

Circle 451 on Reader Service Card

Automatic In-Process Loading

Automatic loading systems feeding parts to barrel plating and processing equipment, explained by case histories. Illustrated with on-the-job photos, engineering drawings of each installation.

Frederic B. Stevens, Inc.

Circle 452 on Reader Service Card



There is a STEVENS
AUTOMATIC LOADING
DEVICE



LOADS AND UNLOADS VANS
75% FASTER

Loading, Unloading Faster

Wholesaler shifted to fork lift trucks to handle cases of food products on pallets, cut truck loading and unloading time 75%, with 50% less manpower. Towmotor Job Study No. 180.

Towmotor Corporation

Circle 453 on Reader Service Card

Fork Truck Weighs

Attachment for Clark fork truck electronically weighs anything truck picks up. Uses load cell. Adjusts for tare. Pamphlet (SS-1665) diagrams unit, mounting, gives capacities, explains operation.

Clark Equipment Co.

Circle 454 on Reader Service Card

Flatbed Body For Truckster

Bulletin from Cushman describes flat-bed body and stake racks for Truckster industrial truck. Gives dimensions, price.

Cushman Motors

Circle 455 on Reader Service Card

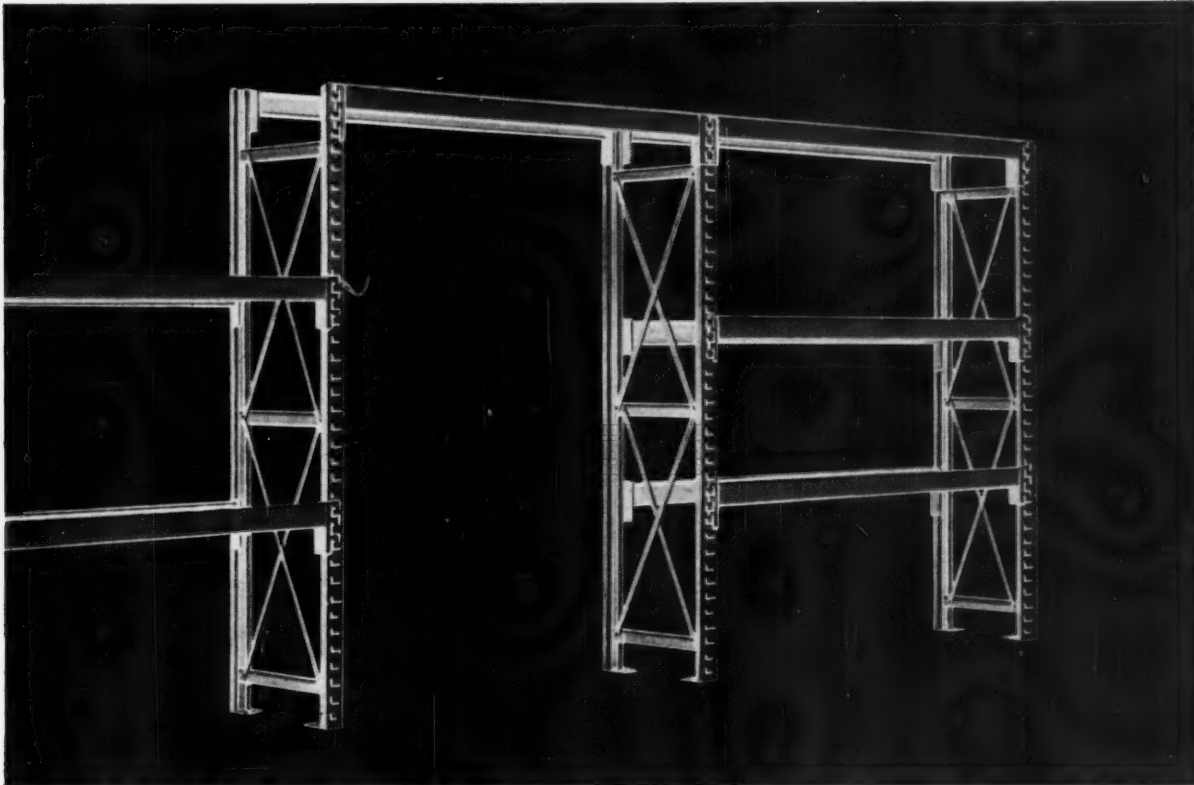
Engineered Conveyors

Brief descriptions of main components such as trolleys, and explanation.

Continued on page 96

MATERIAL HANDLING ENGINEERING

PALMER-SHILE UNVEILS the standard series 75

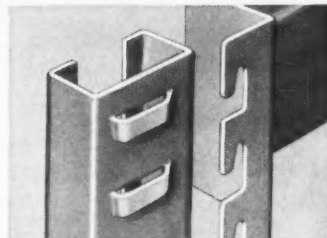


... AVAILABLE FROM STOCK AT LESS COST

Here's the biggest news in the materials handling industry in years. Production of the Standard Series 75 storage rack now makes it possible for you to order the finest rack system available ... *from stock*. The new Palmer-Shile Standard Series 75 storage rack fulfills *more* requirements in a *more* superior manner than any rack in Palmer-Shile history. There's a range of 16 potential rack sizes to choose from—including a one-shelf-high rack.

The Standard Series 75 has the familiar Palmer-Shile characteristics which have made the custom Series 75 the talk of the industry: uniqueness, adjustability, versatility and strength. There's no metal removal in the construction of uprights. All uprights are sway-braced at the factory. Locks are cold formed from the material itself. Each rack adjusts on three-inch centers from top to bottom.

The Standard Series 75 can be erected in a matter of minutes—there are no third-piece connectors. Cross members lock immediately and positively to the uprights in a two-piece system. All units are finished the Palmer-Shile Safety White, an innovation that increases rack visibility and considerably improves the appearance of storage areas. Each shelf carries a conservatively rated 4,000-pound capacity. Before you consider the purchase of any rack you owe it to yourself to check into the facts: to see how much better, quicker and more economically the Standard Series 75 can serve your storage needs.



Costs and sizes for the Standard Series 75 are as follows: UPRIGHT FRAMES, 96" x 30" (14.25)/96" x 36" (14.50)/120" x 30" (15.50)/120" x 36" (15.75) /SHELF BEAMS, 54" (6.90)/90" (12.60)/108" (16.25)/120" (19.55). All shelf beam prices and specifications are per pair.

PS PALMER-SHILE
SERVING THE MATERIALS HANDLING NEEDS OF THE NATION
16000 FULLERTON, DETROIT 27, MICHIGAN

Circle 94 on Reader Service Card

NEW **DUD-FAST** MODEL S-763



Powered to drive heavy staples up to 2" long



This new S-763 drives four 2" staples in less time than it takes to pound one nail.

Ideal for staple nailing crates, wood frame assemblies, expendable skids and similar jobs requiring maximum holding power.

Drives 1½" to 2", 16-gauge staples that outhold equivalent nails. Operates at 60 to 100 psi. Lightweight, easily portable, one-hand operation. Built-in safety features prevents accidental firing.

Write today for the complete story on this new S-763 Staple Nailer.

FASTENER CORPORATION, 3700-A River Road, Franklin Park, Illinois

DUD-FAST

Staplers
Tackers
Staples

Everything you need for tacking, stapling and nailing.

Circle 48 on Reader Service Card

BULLETINS CATALOGS FILMS

tion of how to use in-floor and overhead tow-conveyors, powered and free overhead trolleys, in folder "Custom Engineered Conveyor Systems."
Jervis B. Webb Co.

Circle 456 on Reader Service Card

Manual on Cost Cutting

Eighty page "Handbook of Cost Cutting Material Handling Ideas" discusses cost effects of aisle widths, truck types, pallet handling, systems analysis, battery selection. Bulletin 5025.

Automatic Transportation Co.

Circle 457 on Reader Service Card

Nailless-Closure Boxes

You get Evans Self-Locking wooden boxes KD. Assemble and use without nails, save 80% of box assembly time. Can be knocked down at destination, returned, reused. Meets government specifications. Explained in 4-page folder.

B & F Box & Lumber Co.

Circle 458 on Reader Service Card

Bag Packer Fills, Weighs

Stoker DX Packer has standard weighing scale, electronic sensing and control. Accuracy repeatable to ¼-oz. on 500 lb. load. Use in filling bags or drums with grains, pellets, flakes described in 6-page folder.

H. L. Stoker Co.

Circle 459 on Reader Service Card

Sling with Safety Ring

Warning ring visibly elongates when Sentry Sling is overloaded. Five capacities, 3,250 lb. to 23,000 lb. Color pamphlet describes fully.

Campbell Chain Co.

Circle 460 on Reader Service Card

Truck Cargo Braces

How metal cargo braces serve as dunnage in trucks and trailers is presented in series of bulletins illustrating components and installation.

Load-Holder

Circle 461 on Reader Service Card

Portable Case Sealer

Bulletin illustrates adjustable automatic case sealer and taper, caster-mounted to enable use on 3 separate lines. Working briefly described.

General Corrugated Machinery Co., Inc.

Circle 462 on Reader Service Card

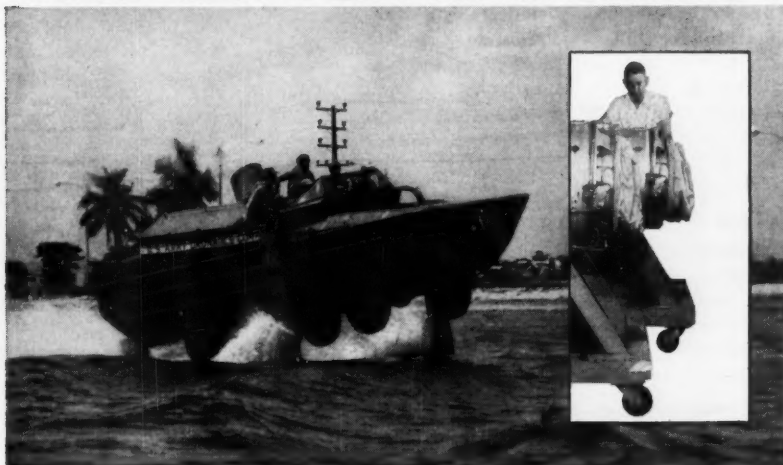
Continued on page 98

MATERIAL HANDLING ENGINEERING

MATERIALS-HANDLING NEWS

NEW AND UNUSUAL APPLICATIONS OF BASSICK CASTERS THAT MIGHT BE ADAPTED TO YOUR HANDLING PROBLEMS

"DUCK" GETS A LIFT FROM BASSICK'S



Here's a boat that rides on stilts.

It's the U.S. Army's "Flying Duck" that attains speeds up to 50 miles an hour on hydrofoil wings that hold it suspended several feet above the water.

But, new vehicle, old materials-handling problem—solved by Bassick: The "Flying Duck's" high-powered T53 gas turbine engine, made by Avco Corporation's Lycoming Division, moves down the pro-

duction line on heavy-duty Bassick "S99" casters.

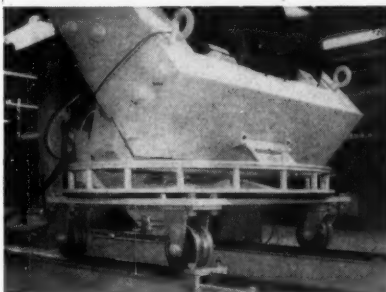
Made of extra-heavy-gauge steel, formed in Bassick's 300-ton presses and with full double-race ball-bearing swivels, "S99" casters are built to take production-line abuse on power-pulled draglines, dollies, assembly fixtures at all manual speeds. They're especially recommended for warehouse draglines, too.

"GROOVED-WHEELS" HELP ROLL RESEARCH AHEAD

Here's a novel application for extra-heavy-duty Bassick grooved wheel casters:

The casters provide flexible, easily controlled movement for a 6,000-pound electromagnet, used in advanced research at Pennsylvania State University, University Park, Penna.

The angle-iron track structure, on which the grooved-wheels ride, provides a controlled path for the scientific apparatus, saves floors, and makes for easy rolling.



Note rigid casters on one track, swivel casters on the other, to prevent binding. Can you use this idea in your plant for especially heavy loads?

SEE YOUR BASSICK DISTRIBUTOR

... he will be glad to recommend casters to solve your materials-handling problems—new or replacement—and he carries a broad selection of casters in stock for immediate delivery.

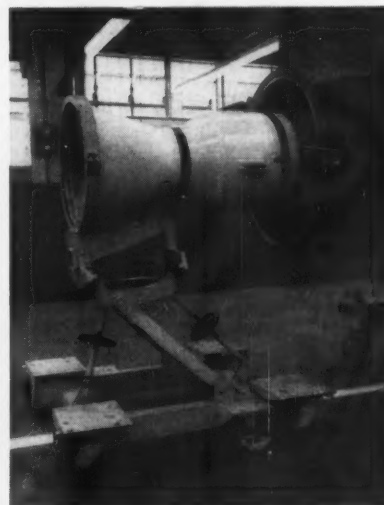
DID YOU KNOW

... that Bassick, the world's largest caster-maker is also the world's largest manufacturer of office chair tilt-control mechanisms?

THE
BASSICK COMPANY
BRIDGEPORT 5, CONN.
IN CANADA:
BELLEVILLE, ONT.



Circle 14 on Reader Service Card



Boeing photo

CASTERS SPEED "BOMARC" ASSEMBLY

Part of America's first line of defense is the U.S. Air Force "Bomarc" supersonic area-defense missile, made by Boeing Airplane Company, Seattle, Washington.

This behind-the-scenes picture shows how Bassick casters aid installation of Bomarc's vital tail-pipe assembly.

Casters used here: Popular "H99" on the dolly in the background—the largest-selling high-quality truck caster on the market; and Bassick's heavy-duty "S99" in the background, supporting main missile structure. Bassick positioning jacks hold the parts, at the touch of a toe, in the exact position required for efficient work.

Some Cost-Cutting Can Be Painless

Materials-handling costs, usually 30% of production costs, are among the easiest costs to cut in a plant that's caught in the well-known profit squeeze. And Bassick casters, position locks, and wheel brakes help you save two ways: (1) you improve operations efficiency by better mobilization and utilization of equipment, better product handling; (2) you cut maintenance costs on casters, dollies and equipment, and floors.

1.41

BULLETINS CATALOGS FILMS

Industrial Truck Quality

"Building a Quality Product" shows in pictures manufacturing techniques developed to promote quality of El-par electric industrial trucks.

The Elwell-Parker Electric Co.

Circle 463 on Reader Service Card

Temperature Controls

"Temperature Regulating Devices" describes temperature control system, components, gives information for do-it-yourself application. Suitable for

materials in process, air, liquids, rooms or small containers.

American Instrument Co.

Circle 464 on Reader Service Card

Pack, Ship, in Glass Cushions

Cushions made of glass fibers bonded by plastic resin protect delicate products. Folder shows uses, how to mold or cut cushions, and gives properties including thermal conductivity, deflection under static load.

Fibrous Glass Products, Inc.

Circle 465 on Reader Service Card

New Fir Plywood Standards

Preprint of U.S. Commercial Standard on Douglas Fir Plywood, CS 45-60 effective Nov. 1960, offered by Douglas Fir Plywood Assn. (Appen-

dix on grade markings, part of this preprint, will not appear in edition to be issued later by U.S. Gov't Printing Office).

Douglas Fir Plywood Assn.

Circle 466 on Reader Service Card

Model of Plant Layout

Booklet "3-D Attack on Plant Layout" explains how to order plant layout models, gives figures for estimating costs. Offers layout-making practice kit for \$98.75.

"Visual" Plant Layouts, Inc.

Circle 467 on Reader Service Card

Large Diameter Flexible Tubing

Booklet describes 7 types of "Flex-lyte" flexible tubing, which can be used for material handling systems, ventilation, fume removal.

Flexible Tubing Corporation

Circle 468 on Reader Service Card

Slide Film: Servicing Hydraulic Transmission

Title: "Servicing The Clarklift Hydrator." A 43-minute slide film. Describes how the power-shifted transmission works and shows how to troubleshoot. Hydrator is the hydraulic transmission on Clark's line of 2,000- to 5,000-lb. fork trucks.

*Industrial Truck Div.,
Clark Equipment Co.*

Circle 469 on Reader Service Card

9,000-Lb. Capacity Tractor Shovel

Model W-12 described in a 15-page bulletin. Shown at work in many industries. Lists optional equipment. Full specifications. Sections of the bulletin are broken into breakout action, balance and traction, and fast, easy operation.

J. I. Case Co.

Circle 470 on Reader Service Card

Wire Rope Catalog

This 156-page illustrated Catalog 493 contains specific recommendations for use of wire ropes on various types of construction and industrial machinery. Ropes selected are those which give the best performance on power shovels, dredges, scrapers, dozers, derricks, hoists, pile drivers, pavers, overhead traveling cranes, car spotters, conveyors and winches. Rope reeving diagrams show typical line arrangements. Catalog also includes basic wire rope information, and discusses special rope features, grades, construction, lays and cores.

Bethlehem Steel Co.

Circle 471 on Reader Service Card

Continued on page 100

**NEW!
DIFFERENT!**

MagnaLift LIFT MAGNET

with self-contained power supply



2000 LB.
and
4000 LB.
CAPACITIES

for scores of
lifting jobs...
for conveyors and
other automatic
handling equipment

Use it in the plant. Use it outdoors. Use it with remote control. You'll like MagnaLift features such as these: Power pack an entirely separate unit from magnet—power pack can be placed on magnet or placed elsewhere for remote control by extension cable—OFF-ON switch located on top of unit for maximum convenience—built-in charging indicator and plug-in receptacle for battery power pack. You'll like the way MagnaLift makes lifting jobs easier, safer, faster. Send for complete details about MagnaLift, the new and different lift magnet. Write MH-461.

Model LM4, \$385.00 F.O.B. Big Rapids, Mich.

3 Power Packs (Interchangeable)

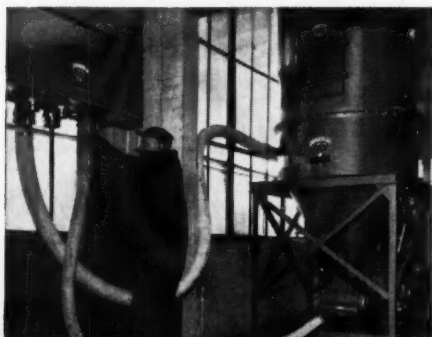
12-VOLT BATTERY

12-VOLT BATTERY—
VARIABLE HOLDING
POWER

110-VOLT A.C.—
BUILT-IN D.C.
RECTIFIER

Hanchett MAGNA-LOCK CORPORATION BIG RAPIDS, MICHIGAN, U.S.A.

Circle 62 on Reader Service Card

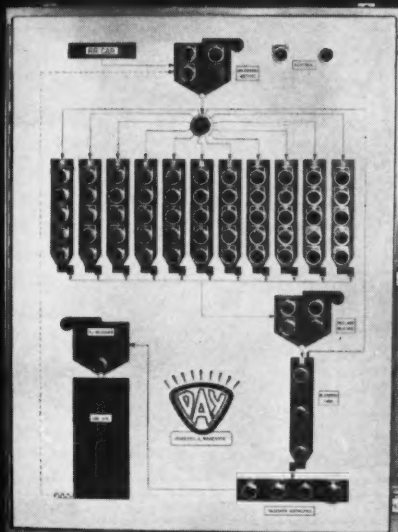
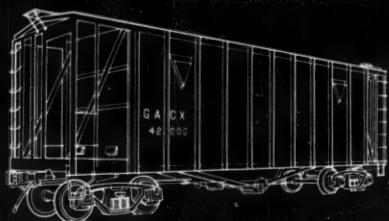


High density pneumatic conveying system for unloading polyethylene pellets from railcar. After piping connections are made, dual-purpose DAY "RJ" receiver, shown right in photo, "pulls" product from railcar and "pushes" it to storage tanks or manufacturing process.

PUSH A BUTTON



UNLOAD A RAILCAR



DAY Control panel — your most efficient link between railcar and plant, storage or process.

Save manpower, time and money unloading railcars with DAY *air-line* pneumatic conveying systems. They provide a sanitary, low cost way to unload, transport in-plant, mix, dry, cool or load any type of dry material. DAY *air-line* pneumatic conveying systems are pneumatically conveying close to 200 different products. Take advantage of this DAY experience. Discuss your pneumatic conveying and plant storage equipment requirements with DAY. Only DAY offers a complete service, including: *engineering, fabricating and installation of everything* (including bulk storage tanks) needed for efficient, economical systems. **FREE** bulletin describes all types of pneumatic conveying systems. It tells how you can make substantial savings 9 ways and improve plant efficiency 6 ways with DAY *air-line* pneumatic conveying systems.



CLIP AND MAIL COUPON TODAY

The DAY Company

874 Third Ave. N.E., Minneapolis 13, Minn.

In CANADA
The DAY Company of Canada, Ltd.
15 Brydon Dr., Rexdale (Toronto) Ontario

Please:

☐ Send Bulletin M-588 (Pneumatic Conveying Systems)

☐ Send Bulletin 574 (Tanks for Bulk Storage)
☐ Have DAY Representative Contact Me

NAME _____

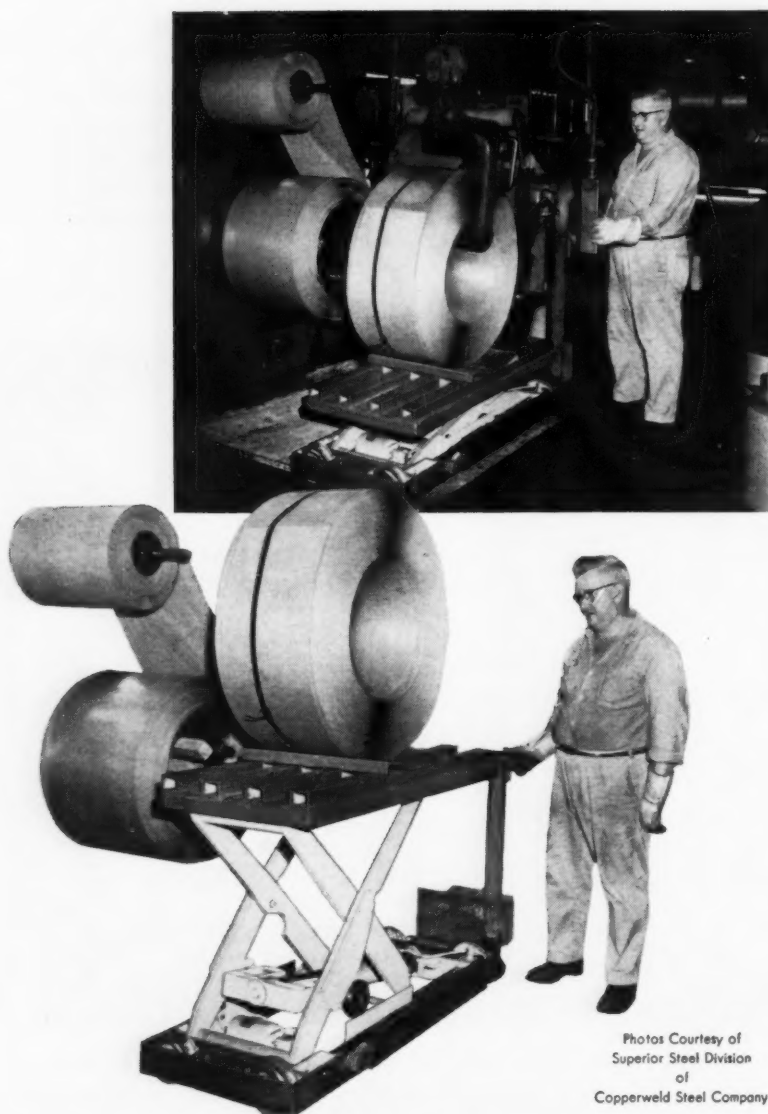
COMPANY NAME _____

ADDRESS _____

CITY _____

STATE _____

Circle 37 on Reader Service Card



Photos Courtesy of
Superior Steel Division
of
Copperweld Steel Company

SOUTHWORTH "CUSTOM ENGINEERING" SOLVED THE COIL HANDLING PROBLEM AT SUPERIOR STEEL

The "coil buggy" shown is one of several 5000-pound capacity, mobile and adjustable hydraulic Southworth Lift Tables* specially adapted for use at recoilers of Superior Steel with a triple purpose: (1) to safeguard workmen by reducing accident hazards; (2) to protect the highly polished surfaces of the quality stainless strip steels; and (3) to increase efficiency by facilitating the handling of the coils from the recoiler. The success scored by this installation is one more example of how Southworth engineers cut costs through improved use of existing facilities. Why not let Southworth help you increase safety, efficiency and handling at *your* plant? Write:



*PATENT PENDING

SOUTHWORTH LIFT TABLES

a division of SOUTHWORTH MACHINE CO., 304 Warren Ave., Portland, Me.

Circle 114 on Reader Service Card

BULLETINS CATALOGS FILMS

Fast Package Tying

The Bunn package tying machine is described in an 8-page bulletin. It presents many case histories. Unit automatically ties packages and bundles, regardless of shape, that can be tied by hand. Company says main advantages are speed, and the uniform tightness. Bulletin shows how you can tie an average sized package in less than 2 seconds.

B. H. Bunn Co.

Circle 472 on Reader Service Card

Fits Your Shelving Needs

Key-Way Metal Shelving locks shelves and end panels securely in position while supporting heavy loads. Shelves can be installed at any desired height. Literature details features, and shows 4 basic shelving types that can be quickly erected with the interchangeable shelving parts.

W. R. Ames Co.

Circle 340 on Reader Service Card

Power Strapping Machines

Four-page folder covers line of M-20 electric-powered strapping machines. Charts characteristics of four standardized general purpose machines. Also covers the M20-A for hardwood flooring, and the M20-RB for end-binding of paper rolls. Presents engineering features and action pictures.

Signode Steel Strapping Co.

Circle 341 on Reader Service Card

Industrial Financing Services

"Financing Business Action Under Today's Conditions" nontechnically describes it. Broken down into accounts receivable financing, factoring, inventory loans, equipment loans, industrial sale and lease financing, financing of mergers, buyouts, and acquisitions, and rediscounting.

*Industrial Division Dept.
Walter E. Heller & Co.*

Circle 342 on Reader Service Card

Skid Types

Comprehensive data on many different skids. Easy to read, compact. Serves as an illustrated catalog. Explains the three types of skids (bolted,

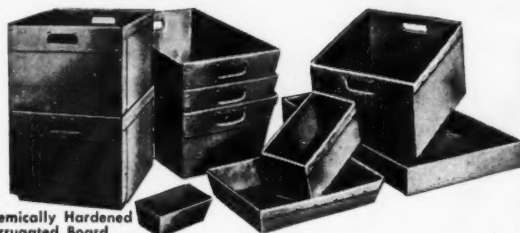
Continued on page 102

MATERIAL HANDLING ENGINEERING

Circle 32 on Reader Service Card

Money talks today:

Dollar for dollar, Convoy* tote-boxes OUTPERFORM all others



Chemically Hardened
Corrugated Board

Low cost, light weight, sturdy, rigid. Wide variety of stock styles and sizes to fit your need exactly. Special shapes quickly and economically made in any quantity because die cost is negligible in our "Chem-Board" process.

More and more famous name industries are using Convoy Tote Boxes. Try us.

CONVOY, INC.

CANTON 6, OHIO

P. O. BOX B, BOX 216-F



Circle 8 on Reader Service Card

THE BIG NEWS ABOUT AMERICAN ENGINEERING LO-HED® HOISTS & CAR PULLERS



AMERICAN ENGINEERING
LO-HED HOISTS AND CAR
PULLERS are now being
engineered and manufactured
in the Aircraft Armaments, Inc.
plant at Cockeysville, Md.

Be assured that the same crafts-
manship and high standards of quality
which make LO-HED HOISTS and CAR
PULLERS leaders in their field will be
maintained in the IMMEDIATE
CONTINUED PRODUCTION by Aircraft Armaments, Inc.



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AIRCRAFT ARMAMENTS, INC.

Post Office Box 6853, Baltimore 4, Maryland

CLEVELAND DISTRICT: A.E. Company, 1157 Leader Bldg., Cleveland 14, Ohio
N. Y. DISTRICT: AE Industrial Division, 1 Exchange Place, Jersey City 2, N. J.

when you look for dockboards
COMPARE SIZE ... COMPARE PRICE
... COMPARE CAPACITY with

**Langsenkamp's DOCK
PLATE**
LIGHTWEIGHT—LOW-COST
SUPER STRENGTH
ALUMINUM

GREATER CAPACITY PLUS ECONOMY!

Langsenkamp gives you an economical dock plate with greater work-load capacity to handle today's increased pay-loads.

It doesn't get tired! Special alloyed-aluminum has superior fatigue-resistance, giving Langsenkamp dock plates longer life.

Handling ease—Most sizes are so light in weight that one man can handle them easily.

9 Styles ... capacities up to 15,000 lbs. Over 65 stock sizes from 24 x 48" to 96 x 60" plus all popular options such as fork lift brackets, side rails and stop pins.

Exclusive—Optional abrasive safety surface gives permanent non-skid protection even when wet!

<p>6,500 lbs.</p> <p>BRAND X 24" x 48"</p>	<p>7,000 lbs.</p> <p>BRAND Y 24" x 48"</p>	<p>8,500 lbs.</p> <p>BRAND Z 24" x 48"</p>
---	---	---

12,000 lbs. Capacity - 24" x 48"

still as low as **\$49⁰⁰**

F. H. LANGSENKAMP COMPANY

229 E. South Street
Indianapolis, Indiana

Circle 67 on Reader Service Card

SILENT HOIST

sets the pace again...



SILENT HOIST
KRANE KAR

2 SIZES:

MODEL FAX—12,000 lbs. cap.
MODEL FAY—20,000 lbs. cap.

360° SWING

180° SWING

5 SIZES:

1½, 2½, 5, 10, 12½ tons

360° BOOM SWING—Now . . . another addition to the famous family of Silent Hoist KRANE KAR . . . the original Mobile Swing Boom Crane! **BOOM ROTATION:** All-Hydraulic 360° continual rotation on heavy-duty double-race ball-bearing turntable. **BOOM:** 15/22 ft., manual or hydraulic telescoping. **TRANSMISSION:** Hydraulic power shift directional in combination with flywheel torque converter. **STEERING:** Full time power steering, finger-tip control. **ENGINE:** Heavy duty 6 cylinder valve-in head type. **BOOM TOPPING:** Horizontal to highest vertical in only 8 seconds. **BOOM HOISTING:** Load block 3 parts of line 25 to 55 fpm. **TIRES:** Dual pneumatic tires on traction axle for high flotation and extra blow-out protection. **TOTAL VISION AND SAFETY:** No obstruction in any position of load or crane; operator fully protected through 360° rotation of boom. Write for complete details in illustrated bulletin #99.

180° BOOM SWING—The Standard widely favored All-Hydraulic or Mechanical 180° swing boom crane models. Lifts, carries, and places any load up to 12½ tons. One engine powers the machine for travel and all crane applications—finger-tip control. Front traction wheel drive supports chassis and crane load. 2 geared speeds for hoisting, topping, and swinging. No tail swing—Boom never passes over Operator's head. Write for complete details in illustrated bulletin #79.

SILENT HOIST & CRANE CO.
BROOKLYN 20, N. Y.

Circle 113 on Reader Service Card

bolted and welded, and welded) and offers important design information. Bulletin 60.

Ironbound Box & Lumber Co.

Circle 350 on Reader Service Card

Film Strip, Booklet on LP-Gas Conversion



Film strip shows, step by step, how carburetion system is converted to LP-Gas. Commentary given on 33 r.p.m. record. Details in accompanying 46-p. booklet, "The Conversion of Mr. Hogan." To borrow film strip and obtain booklets, write to Century Gas Equipment, Marvel-Schebler Products Div., Borg-Warner Corp., Decatur, Ill.

Meters, Feeders, Controls — Capsule Information

General Bulletin No. 0001.20.1 gives brief data on many of the company's products and systems. Covered are butterfly valves, supervisory control systems, totalizing meters, water and waste treatment and systems, flow meters, process instrumentation, and feeders for solids and liquids, and blenders for liquids.

B-I-F Industries

Circle 351 on Reader Service Card

Light Hauler-Dumper

The Cushman 780 Truckster equipped with a Percival dump hopper. Detailed photographs of construction and features. Bulletin discusses the savings this unit may bring you.

Cushman Motor Works

Circle 352 on Reader Service Card

MATERIAL HANDLING ENGINEERING

Eliminate Human Errors

Folder 2023 covers Printweigh Scales, their advantages and their uses. Bench, portable, and two floor scales are fully described, and features and advantages listed. The various reasons for using automatically printed weight data to help guard costs through elimination of human errors are pointed out.

Toledo Scale
Division of Toledo Scale Corp.
Circle 353 on Reader Service Card

Air Force Says Carriers Rough on Loads

Air Force study describes results of tests to determine how roughly packages are handled. Conclusions: Inexpensive testing is feasible. Air, rail, and truck transit are about equally rough. Only 1 package out of 100 is dropped more than 29 in. during shipment. To get a copy order "Measuring Field Handling and Transportation Conditions," PB 161 918, from CTS, U.S. Dept. of Commerce, Washington 25, D.C. Price \$1.

NOW YOU CAN LIFT and DUMP ANY CONTAINER!

Dumping standard drums, barrels, boxes and bags is a cinch!

MORE IMPORTANT, no matter what size, shape or type container you use to process free-flowing material — even special in-plant containers — ESSEX can supply the necessary unit for dumping or work-positioning.

ESSEX Dumpers are flexible in design. They can be engineered to suit your individual requirements. For the safe, reliable, economical way to lift and dump (or position) material in any container . . . CALL UPON ESSEX FOR THE ANSWER.

SEND FOR NEW 8 PAGE
INFORMATIVE CATALOG #59

ESSEX
CONVEYORS, INC.

Dept. MH, 101 Colden St., Newark 3, N.J.
In Canada: Griswold Engineering, Ltd.,
Montreal and Toronto



HYDRO-DUMPER

Dumps up to 4 feet (higher if platform mounted). Load capacity in excess of 6000 pounds.



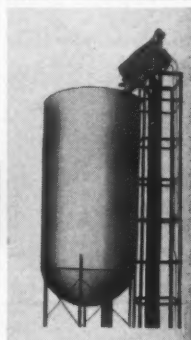
JUNIOR DUMPER

Dumps up to 8 feet (higher if stationary unit). Load capacity 700 pounds.



SENIOR DUMPER

Dumps up to 20 feet. Load capacity in excess of 4000 pounds.



VERTICAL DUMPER

Dumps to any practical height. Load capacity in excess of 4000 pounds.

OPEN ANY FREIGHT CAR DOOR IN 20 SECONDS OR LESS with the



ONE-MAN
CAR DOOR OPENER

Write for complete details
and railway products catalog

ONLY **\$4500**
F.O.B. Bowerston

The Nolan Co., 110 Pennsylvania St., Bowerston, Ohio

Circle 87 on Reader Service Card

April, 1961

Rapisteel

builds useful
racks, bins, tables, dollies—
faster, easier, and at lower cost

New Rapistan design slotted angle is fast and easy to work with, designed for all in-plant construction needs. Corrosion resistant, completely re-usable, extra durable, easy to handle. Write today for these illustrated Rapisteel construction guide books.



RAPISTEEL CONSTRUCTION IDEA MANUALS — FREE!

The RAPID-STANDARD CO., INC.
511 Rapistan Building
Grand Rapids 2, Michigan



Circle 97 on Reader Service Card

GO-GETTER *Finger Tip Control* for Speed, Ease, Safety

Go-Getter powered lift trucks are available in six basic models in each of four series (stand-on or walkie, explosion proof or standard) with a range of sizes and capacities in each.

The Go-Getter is fully powered for both traction and lift. Safety factors include fingertip lift control and warning horn. Dynamic brake for down-grade control and deadman mechanical brake for positive stops are controlled by a single directional switch. Stand-on models give the operator a clear view in any direction of travel. Position of operation is fully inside the truck, offering protection from obstructions.

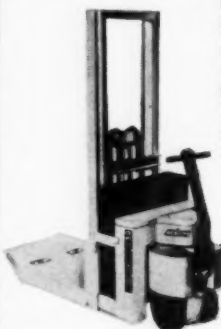
INDEX No. 54.11

Go-Getter low-lift platform model (ride-on explosion proof) for transporting skids. Also in standard and walk-along series.



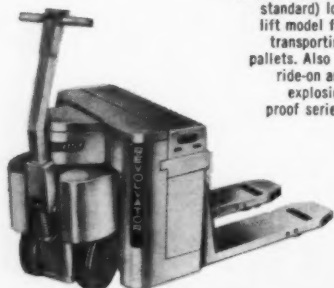
INDEX No. 52.12

Go-Getter (Walk-along standard) high lift platform model for transporting and high piling skids. Also in ride-on Explosion Proof series.



INDEX No. 52.21

Go-Getter (walkie standard) low lift model for transporting pallets. Also in ride-on and explosion proof series.



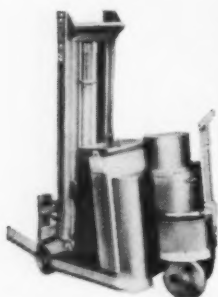
INDEX No. 53.22

Go-Getter (stand-on standard shown with overhead guard) high fork lift straddle model for narrow aisle tiering of pallets or skids. Also in walk-along and explosion proof series.



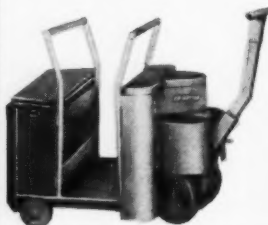
INDEX No. 55.23

Go-Getter (walk-along explosion proof) counterbalanced high lift fork model for tiering skids or pallets. Also ride-on and standard models.



INDEX No. 52.30

Go-Getter (Combination walk-along rider) towing tractor. Also in walk-along only and standard and explosion proof ride-on series.



REVOLVATOR CO.

ESTABLISHED 1904

Designers and Manufacturers of Portable Elevators, Power and Hand Lift Trucks, Hydraulic and Traction Elevators, Carboy and Barrel Dumpers, Portable Cranes, Positioners, Storage Racks, Turntables and Other Material Handling Equipment.

8739 Tonnele Avenue
NORTH BERGEN, NEW JERSEY

Sales Representatives in Leading Centers
Circle 99 on Reader Service Card

PRODUCT

NEWS

Continued from page 50

Automatic Door Opener

Air-Lec door operators work on almost any door. Actuated by low-voltage or mechanical trip. Air and springs open door, cushion shock,



prevent harm to people or equipment. Dependable, durable, low-cost. Flush mounted, simple to install and maintain.

Schoelkopf Mfg. Co., Inc.

Circle 311 on Reader Service Card

Protect Electric Cable

Pow-R-Matic reels pay out, take up electric cables from 15 ft. to a mile long. They neatly store and protect cables from abuse. Dust- and moisture-tight, explosion-proof. Dependable retraction. Cables may have up to 90 conductors.

Aero-Motive Mfg. Co.

Circle 312 on Reader Service Card

30 Tons with Ease

M600A Straddle Truck carrier features all-hydraulic lift system. Has 2



pumps—one powers the load lift, the other the shoe swing and steering. Full-flow hydraulic oil filter in tank fill tube continuously filters all oil as it goes through the system.

Hyster Company

Circle 313 on Reader Service Card

Assembly Lazy Susan

Rotary bench stand for maker's Plastiboxes keeps parts and fittings

Continued on page 106

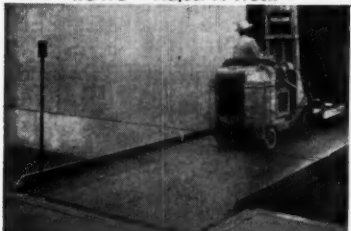
MATERIAL HANDLING ENGINEERING



ROWE — Adjust-A-Dock



ROWE — Adjust-A-Truck



ROWE Double leaf crossover bridge

Select the Best... from ROWE's complete line of

- Dock and truck leveling devices
- Crossover bridges

Over 80 standard electro-hydraulic and air-oil powered dock level devices with 10,000 or 20,000 lbs. capacities and 6 mechanical, truck actuated units with 20,000 lbs. capacity are now available.

Electro-hydraulic truck levelers installed where space is limited, available in 40,000 lb. capacity.

Crossover bascule type bridge electro-hydraulic operated in either double or single leaf units. Capacities to customers specifications.

ROWE METHODS, inc.

WRITE FOR
DETAILED
LITERATURE

2534-C DETROIT AVENUE • CLEVELAND 13, OHIO

No more marking problems

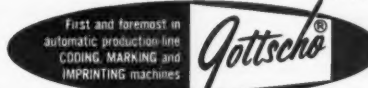


with an automatic "ROLACODER" marker

Attaches to conveyor, case-sealer, etc. to mark from side or top • Works by friction • Imprints legible mark in same spot on case after case • Takes only 1 or 2 minutes to change type • No tricky adjustments • Precision-made for long trouble-free service • Pays for itself in months • Other models for marking 2 and 4 sides simultaneously.

Now available with amazing 'MAGIC INK ROLL' that never needs re-inking! Made of PORELON® microporous plastic

Write for "ROLACODER" literature



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HILLSIDE 5, N.J.**

In Canada: Richardson Agencies, Ltd. • Toronto & Montreal



**FREE
SAMPLE**

*Dow Corning
Silicone
41 Grease*

for LUBRICATING Substrates at High Temperatures

SILICONES CUT MAINTENANCE!

Dow Corning silicone lubricants stay on the job from —100 to 450 F. . . won't bleed and drip, won't oxidize in heat or stiffen in cold. Ideal for conveyor bearings, motor bearings . . . ball bearings in any use. Write today for FREE SAMPLE and literature. Dept. 5216.

first in
silicones **Dow Corning CORPORATION**
MIDLAND, MICHIGAN

Circle 39 on Reader Service Card

FLEXCO® HINGED CONVEYOR BELT FASTENERS

**NOW ONE TYPE FASTENER
TO JOIN BELTS OF
DIFFERENT
THICKNESSES**

500X
FOR THICK
BELTS

250X
FOR THIN
BELTS

**STEEL TIPPED
NYLON COVERED
HINGE PIN
... WILL NOT
MIGRATE!**

GET THE FACTS:
SEE YOUR SUPPLIER OR
WRITE FOR BULLETIN HF-502

Flexible **STEEL LACING COMPANY**

4717 LEXINGTON ST. • CHICAGO 44, ILLINOIS

Circle 50 on Reader Service Card

INDUSTRY NEWS



conveniently in reach. It turns easily, stays put for efficient work. Boxes easily removed for refilling. Many size combinations possible.

G. B. Lewis Co.

Circle 314 on Reader Service Card

Strapper Saves Labor

Air-powered AMP strapping tool engages feed wheel, tensions strapping, applies seal, then cuts the strap from the coil and releases feed wheel. Operator feeds strapping into tool, guides tool through operations. There are no tensioning or sealing handles,

base is short. Works well in cramped space, on small packages, vertically or horizontally. Weighs 22 lbs. Regular and high tension models, all adjustable.

Signode Steel Strapping Co.

Circle 315 on Reader Service Card

Finish Protection

Scuff-Master containers guard the finish on packaged products, prevent abrasion. Special coating controls scuff damage that results from vibration and product movement. Useful with baked enamel, chrome, and wood finishes, reduces refinishing.

Olin Mathieson Chemical Corp.

Circle 316 on Reader Service Card

Wheels, Slotted Angle Make live Racks

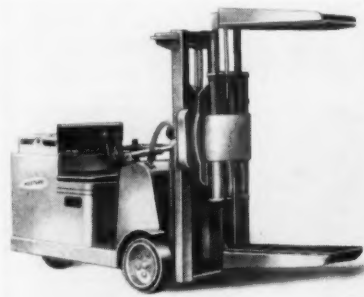
Glidewheels made in nylon or steel for use with slotted angle and punched strap. Both wheels are 2-inch diam. Use nylon wheels for short runs, and in live storage racks. They're efficient, reduce noise, support 25 lb. each. Steel type recommended for long, low-inertia conveyors with shallow slope.

Dexion, Inc.

Circle 317 on Reader Service Card

Handy in Carloading

Hustler STL series lift truck picks up loads of any size, rotates and stacks them in any position. Nesting odd shapes is easy. Truck has full



free lift mast, side shifter, load clamps, revolvator. Pressure gauge adjustment eliminates crushing cartons of varying size. Side shifting load minimizes jockeying truck to position it.

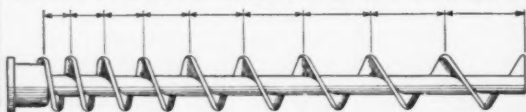
The Heifred Corp.

Circle 318 on Reader Service Card

Oil Barrier Cartons

Corrugated packaging provides barrier to oil and grease. Won't wick through container facings. Boxes in photo were filled with oily sweeping compound (9 percent oil), held

Now! A Screw that Prevents PACKING



Patent Pending

Progressive Pitch Conveyor Screw

With this uniquely designed and constructed screw, material can be conveyed *without packing*! Each pitch is progressively larger so the material is moved forward at a greater speed per revolution and won't bind or clog.

The PROGRESSIVE PITCH CONVEYOR SCREW can be produced for the handling of any material using a spiral shaft conveyor. It can be made in any pitch, diameter and capacity, with right or lefthand flights, to your specifications. 10,000 different combinations of pitches, diameters and sizes are possible. Some standard sizes in stock in different cities.

Install a PROGRESSIVE PITCH CONVEYOR SCREW to replace an old one or to use in your new systems.

**NEW FOLDER THAT TELLS
ALL—SEND FOR IT TODAY!**

Call or write so we may discuss your conveyor needs or problems.

WORLEY EQUIPMENT, INC.

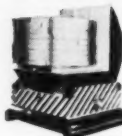
2301 N. Knox Avenue • Phone ALbany 2-2830
CHICAGO 39, ILL.

Circle 135 on Reader Service Card

REMOVE COILS FROM PALLET QUICKLY & EASILY

- Safe
- Labor-Saving
- Efficient
- Won't Damage Material!
- Self-Contained
- Automatic
- Portable

Sizes to handle loads from 3,000 to 40,000 pounds.
Prices start at \$2000.



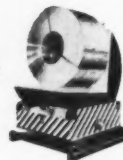
Fork truck sets palletized coils on bed of cradle.



Cradle tips backward as base rotates.



Cradle nears end of 90° backward tip as it is finishing its 180° rotation.



Coils, now off pallet, face truck and are ready to fork.

turnover@cradle

A Product of LA DEAU MANUFACTURING COMPANY
2702 San Fernando Road, Los Angeles 65, California
Telephone CApitol 2-8108

Circle 70 on Reader Service Card
MATERIAL HANDLING ENGINEERING

at 120° F. Treated box (left) almost unaffected after a month. Untreat-



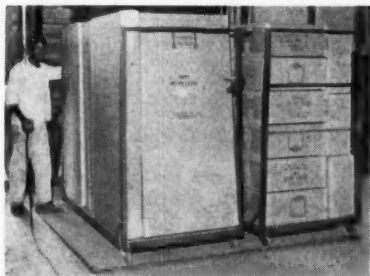
ed one lasted 2 days. Treatment doesn't affect box appearance, printability, or gluing.

Minnesota Mining and Mfg. Co.

Circle 319 on Reader Service Card

Remote-Control Lift

Pushbutton control box, normally mounted on wall, permits remote operation of hydraulic truck-loading platform lift. The box is connected



to a 16-ft. extension cord. Platform, 8 ft. sq., has 3-ton capacity, rises to 58 in. It stops at any point to align with truck bed. Operator may ride with the load or stand aside. Platform descends into shallow pit flush with the floor.

Globe Hoist Co.

Circle 320 on Reader Service Card

Non-Skid Finish Applied Easily

Ruffin anti-slip surface brushes or rolls on floors, decks, ramps, expanded metal grating. Recommended

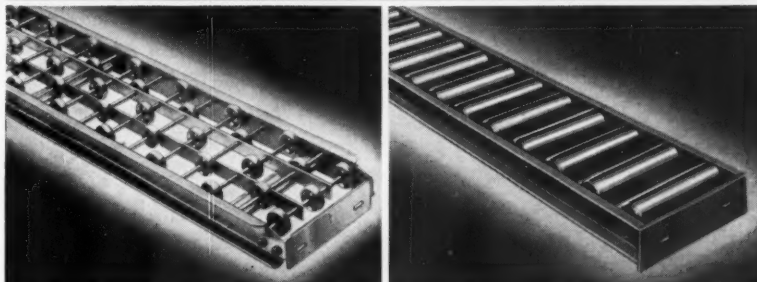


for oily, slick surfaces outdoors. Adheres strongly. Long lasting, weather resistant. Sample panel on request.

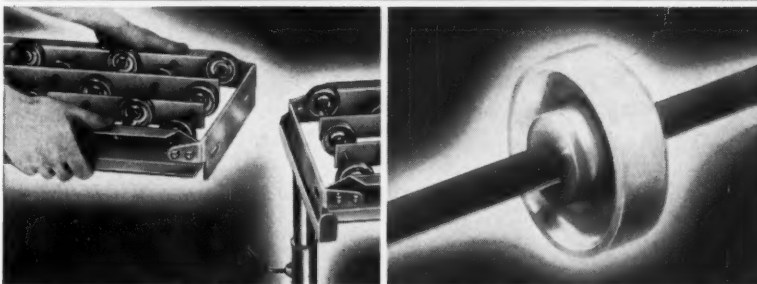
Custom Abrasive Products Co.

Circle 321 on Reader Service Card

Let Gravity Speed Your Loads...on Versatile Roll-or-Wheel BUSCHMAN PORTABLE CONVEYORS



Buschman produces every kind of conveyor system: wheel, roller, belt units; table-cable installations and overhead trolleys. The indispensable old work horse in countless plants, stores and warehouses is the Buschman wheel or roller portable that expedites packages large and small, heavy and light. Buschman portable sections are available from stock in suitable lengths and widths, straight or curved, 2-way or 3-way switch. And every length is equipped with exclusive Quick-Eez Couplings described below. Choice of rollers or wheels depends on weight and nature of package load. Free literature. See yellow pages for representatives, or write The E. W. Buschman Company, 4450 Clifton Avenue, Cincinnati 32, Ohio.



QUICK-EEZ COUPLING

This exclusive Buschman feature is identical on both ends of every section; drops independently into slot on supporting stand, with maximum adjustment to gain correct fall. Quick-Eez is trouble-free, facilitates handling.

BRAND NEW NYLON WHEELS

For any Buschman wheel conveyor, new Nylon Wheels with cadmium plated axles and *Galva-finish* frames are quiet running, corrosion free. Most useful under steam and water conditions: meat packing, poultry, fishery, etc.

Buschman

CONVEYORS

Complete Conveyor Systems for all Industries—Engineered, Manufactured, Installed
Representatives in Principal Cities; See Yellow Pages

361

Circle 17 on Reader Service Card

Make GOODALL Your Buy-Word for BELTING... Watch Handling Costs Come Down!



No matter what kind of product your conveying job involves, you'll find a particular brand of Goodall Belting that will reduce over-all handling costs through longer service life with minimum maintenance.

"SUPER TRIPLE-S". Goodall's finest Bulk Conveyor Belting... with a long-established reputation for outstanding quality and reliability. Used for handling crushed stone up to 10", ores, slag and other highly abrasive materials, wet or dry.

"TRIPLE-S" and **"LA CROSSE"** will serve with equal efficiency and economy in less severe services.

"HI-CLIMBER"®. The heavy-duty Incline Conveyor Belting for handling cartons, boxes, baskets, bags, cans, etc., with the consistent reliability that means low conveying costs. Special diamond-impression non-slip surface keeps packages in place on inclines up to 35°. Widths up to 44".

"SKY-KLEET"®. That name identifies specially-designed rubber cleats available on Goodall Conveyor Belting used for handling packages, small parts, stampings, minerals, chemicals, etc., on fixed or portable conveyors. Cleats are integrally molded to the belt, and spaced at any required distance.



"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch or Write for Catalog

Manufacturers of Mechanical Rubber Products—Since 1870



Standard of Quality HOSE • BELTING • FOOTWEAR CLOTHING • EXPANSION JOINTS • PACKINGS • LINERS, ETC.

GOODALL Rubber Company

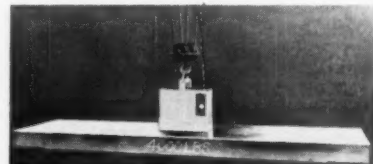
GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N.J.
Branches and Distributors Throughout the United States and in Canada

Circle 57 on Reader Service Card

PRODUCT NEWS

Battery Operated Crane Magnet

Magna Lift picks up and holds 4,000 lb., works anywhere independent of power lines. No chains or



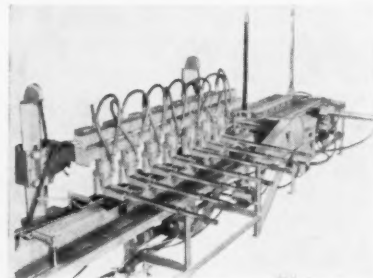
hitches, just place it and turn it on. Built-in dry-charge battery powers it. Built-in charger and charging indicator.

Hanchett Magna-Lock Corp.

Circle 322 on Reader Service Card

Folds, Staples Cartons

Fully automatic machine in 2 sections. First section folds, staples top flap of 5-panel carton. Second stage



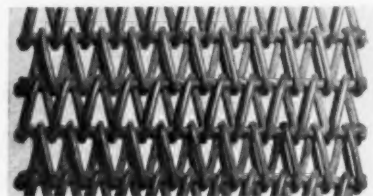
folds, staples the end flaps, discharges finished carton to outgoing conveyor.

International Staple & Machine Co.

Circle 323 on Reader Service Card

Belt of Wire

HD 128 belting woven from ¼-in. medium carbon steel wire in preci-



sion pitch. Widths to 48 in. Positive drive by spike pulley. Conveys hot, heavy forgings and castings. Works

MATERIAL HANDLING ENGINEERING

well in washing machines, under bag packers. May be carburized for long-life. Popular widths in stock.

R. T. Sheehan Co.

Circle 324 on Reader Service Card

Low-Cost Cushioning

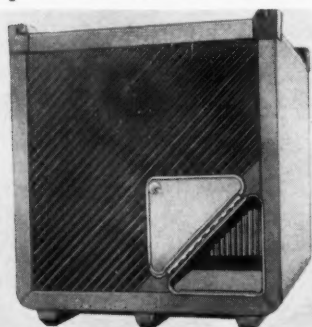
Contour-Foam products are made in low-cost wood and metal dies. Foam compressed in dies squeezes out, distended part is cut off. Material takes desired shape when removed from die. No hard-skin surfaces from molding, is claim. Shapes, dimensions, densities unlimited, tailored to your needs. Thrifty for small or large runs.

Air-O-Plastic Corp.

Circle 325 on Reader Service Card

Water Freight Module

Speeds turnaround in water trans-



port. Tote Bin 8 ft. cube, for bulk handling by barge or ship. Has maker's standard features, and new ones for fill and empty.

Tote System, Inc.

Circle 326 on Reader Service Card

Stock Checkers' Truck

Has writing table and stationery



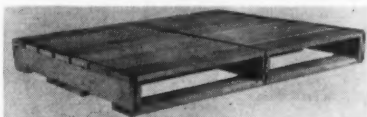
rack welded to frame. All steel welded construction, 3 steel shelves with 1" flange all around. Tubular steel handle. Height to writing table, 50"; to top shelf, 42½". Shelves measure 38" x 20" wide. Roller-bearing casters, rubber-tired.

Palmer-Shile Company

Circle 327 on Reader Service Card

Welded Wooden Pallet

Gibraltar pallet uses resistance



welding to fasten together wooden parts. Steel band runs continuously over deck boards and stringer ends. Prongs of 5-gage wire staples pass through holes drilled in each board and stringer, are welded to the steel band. Strength of the pallet not dependent on nails held in wood. Prin-

ciple may be used for boxes, crates, structures made from lumber or plywood. Repairs, if needed, said to be easy.

Flow Products, Inc.

Circle 328 on Reader Service Card

Fast Repair for Pallets, Crates

Portable pneumatic gun drives 2-inch staples, permits you to build, repair, or alter all types of wood and fiber containers inexpensively. Saves labor, material. Air-driven staples shot

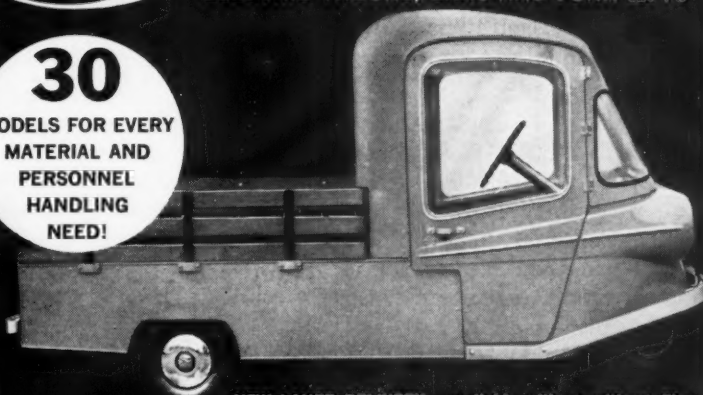
Continued on page 110

Lahe

ELECTRICS

AMERICA'S MOST COMPLETE LINE OF ELECTRIC TRUCKS, CARS AND FORK LIFTS

30
MODELS FOR EVERY
MATERIAL AND
PERSONNEL
HANDLING
NEED!



NEW LAHE DELIVERY - available with or without fiberglass cab, easily removable doors, capacity 1400 lbs. platform size 58" x 42", available with battery charging motor generator for almost unlimited mileage.



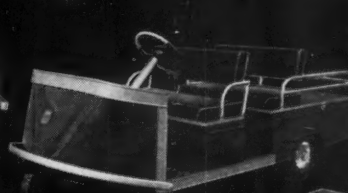
LAHE "ALL-PURPOSE" TRUCK and NURSERYMAN - toughest most versatile electric truck made, 16 gauge diamond plate body, short wheel base for extreme maneuverability - capacity 1400 lbs.



LAHE "PERSONNEL & SHOP CAR"

MATERIAL HANDLING
DISTRIBUTORS:
A FEW OUTSTANDING
TERRITORIES STILL
AVAILABLE.

Write for 1961 Catalog
and Particulars.



LAHE "BELL-HOP" - UTILITY - most versatile personnel carrier - A must for motels-hotels and plant personnel - carries six people plus luggage, etc.



LAHE POWER LOADER LIFT, the most modern, maneuverable, easy to operate Fork available for 1000 to 1500 lb. lifts.

Refer Sweets
Catalog -
engineering
section - also
Thomas Register

WRITE TODAY FOR COMPLETE INFORMATION:

**LAHE SPRING AND
ELECTRIC CAR CORP.**

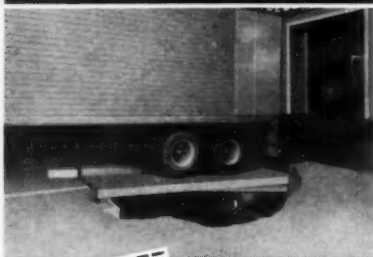
2615 Magnolia St., Oakland, California
New Albany, Mississippi



All Lahe electrics feature exclusive LAHE LUB-O-MATIC control switches; AIR-VAC spring suspension; custom engineered heavy duty Lahe Batteries; 2½" alloy channel steel frames; powerful G.E. motors; instant servicing with hinged tip-up bodies on most models; finest electric chargers - both selenium plate and diode type.

Circle 147 on Reader Service Card

Speed dock traffic



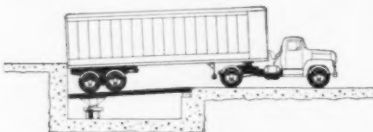
NEW
MODEL

Rotary

Truck Leveler

handles modern trailers with high beds and long overhang

Just a touch of a button and any truck bed is brought into perfect platform level at loading docks equipped with the Rotary Truck Leveler. Dangerous inclines between dock and truck bed are eliminated so that materials handling equipment can move in and out with maximum speed and safety. This modern hydraulically-operated device now has a 16' platform and 3' vertical travel to accommodate highway carriers of all sizes. The Rotary Truck Leveler can be installed at new or existing buildings and saves valuable space since it is recessed into the pavement in front of the loading dock.



RAISES OR LOWERS
TRUCK BED TO DOCK LEVEL

ROTARY LIFT COMPANY

Division of Dover Corporation
Memphis, Tenn.—Chatham, Ont.

MAIL COUPON FOR CATALOG

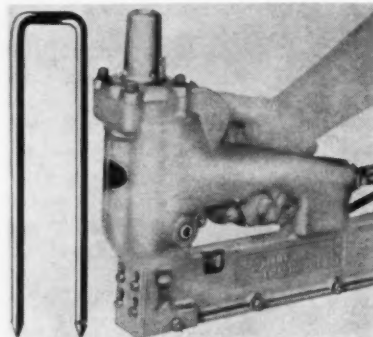
Rotary Lift Company
1057 Kentucky Memphis 2, Tenn.
Please send catalog on Rotary Truck Leveler to:

Name _____
Company _____
Address _____

Circle 103 on Reader Service Card

PRODUCT NEWS

into wood don't split it. Legs of staple and wide crown hold well without pulling through, maker says. For



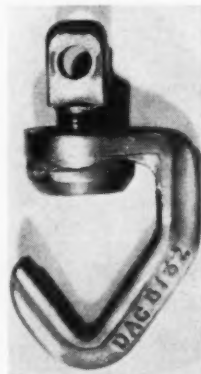
extra shear strength, there's a 6-penny T-nail that fits the gun. A wide crown staple fastens veneer or corrugated. Special guides position fasteners precisely, flip out of way for face nailing.

Spotnails Inc.

Circle 329 on Reader Service Card

Need No Lube

DAC 8152 swivel hooks made of high-tensile manganese bronze need



no lubrication. Offer an answer to dry-wear problems. Ninety-degree indexing, for conveyors through ovens, furnaces. Somewhat greater cost recoverable in savings through reduced downtime due to hook failure and lube expense. Rated 500 lb. tensile strength 80, - 90,000 lb. per sq. in.

Dormont Allen Co.

Circle 330 on Reader Service Card

Custom Conveyors from Stock Parts

Make heavy duty belt conveyors from 7 basic stock components in the Unibelt Series C line. Components fasten together in many different



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CASTERS & WHEELS

FOR ALL INDUSTRIAL
APPLICATIONS



New
DARNELL
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Circle 36 on Reader Service Card
MATERIAL HANDLING ENGINEERING

Circle 132 on Reader Service Card

New low cost VERSATILITY!

HINGED VERTI-LIFT

Model 90"
HY-BOY TWO LIFTS
IN ONE!

- Take it through Doorways
- Move it onto Elevators
- Folded — Lifts 55" from floor
- Extended — Lifts 90" from floor



OFFERS TWO LIFTING RANGES IN ONE UNIT:
To lift or stack up to 90", simply swing up the hinged extension; it automatically locks into place. For moving through doors or under any low clearance, just trip the catch lever and fold down the tower extension. For up to 55" lift from floor no need to raise extension.

FEATURES: • Powered by 12-volt heavy-duty battery
• Built-in safety valve, recharger, ammeter and indicator light • Unitized Electro-Hydraulic Pump • 1500 Pound Capacity at 13" load center • Push Button Controls.

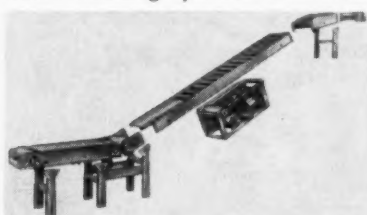


NOW . . . Get your copy of new CM558 HY-BOY Catalog!



WEST BEND EQUIPMENT CORP.
Materials Handling Engineers
335 Water Street • West Bend, Wisconsin

combinations to form continuous materials handling systems. You order



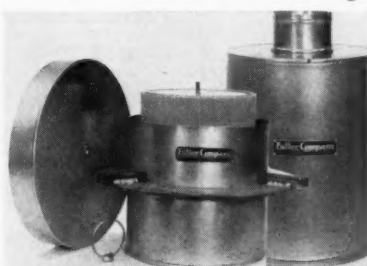
parts by model number. All parts match corresponding live roll and gravity conveyors.

Conveyor Specialty Co., Inc.

Circle 331 on Reader Service Card

Air System Filters

Efficient, portable air filters for vacuum pneumatic unloading systems. One cleans air drawn through



conveying system intake, another filters air entering bulk carrier hatch during unloading. For any application where inlet or make-up air must be free from contamination.

Fuller Company

Circle 332 on Reader Service Card

Box for Groceries

Toteline Repack Box cuts handling costs for warehouses and stores. Fabricated from molded fiber glass, wood, galvanized steel. Tailor-made without molds or minimum orders.



Sturdy 1/16-in. panels bottom and sides, lid is 3/4-in. plywood. All edges, corners and hand holds galvanized steel.

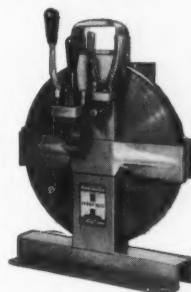
Molded Fiber Glass Tray Co.

Circle 333 on Reader Service Card

(Advertisement)

NEW PRODUCTS

COMBINATION STRAPPING UNIT



Model 00-140—A money-saving strapping "package" including stretcher cutter and dispenser at a low-cost package price, is now available. Write: A. J. Gerrard, 402 East Touhy Avenue, Des Plaines, Illinois.

Circle 21 on Reader Service Card

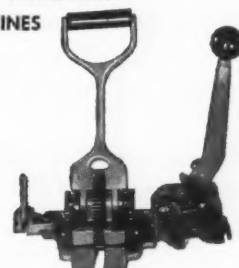
STRETCHER and SEALER



Versatile stretcher for strapping boxes, cartons and bundling of compressible objects. Also, easy to operate sealer for use with 3/8" strap-binder seals. Write: A. J. Gerrard, 402 East Touhy Avenue, Des Plaines, Illinois.

Circle 22 on Reader Service Card

OVAL STRAPPING MACHINES



Model 2822—is available in several sizes and styles to meet practically every industrial requirement. Write: A. J. Gerrard, 402 East Touhy Avenue, Des Plaines, Illinois.

Circle 23 on Reader Service Card

STRAP AND WIRE CUTTER



Model 503—Dual purpose cutter — cuts oval strapping, up to 3/4" wide flat strap, as well as 14 gauge and finer round wire. A valuable tool that pays-for-itself in any receiving or shipping department. Write: A. J. Gerrard, 402 East Touhy Avenue, Des Plaines, Illinois.

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in NEW YORK
CALL
PERMAG
OLYMPIA 7-1818
(TWX: NY 4-4798)

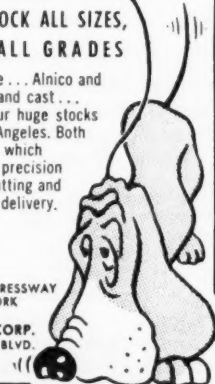
in LOS ANGELES
CALL
PERMAG PACIFIC
WEBSTER 6-6251
(TWX: LA-2086)

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ALL SHAPES, ALL GRADES**

Magnets for every use . . . Alnico and ceramic . . . sintered and cast . . . are available from our huge stocks in New York and Los Angeles. Both plants offer services which include engineering, precision grinding, precision cutting and magnetizing. 24-hour delivery. Write for catalog.

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88-06 VAN WYCK EXPRESSWAY
JAMAICA 18, NEW YORK

PERMAG PACIFIC CORP.
2910 S. LA CIENEGA BLVD.
CULVER CITY, CALIF.



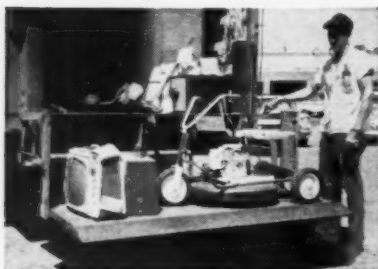
Circle 93 on Reader Service Card

April, 1961

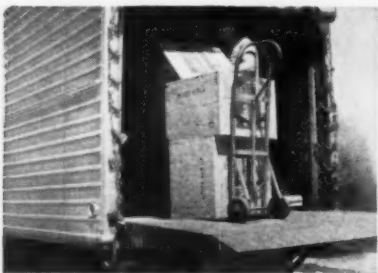
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POWER GATE

owners report
33% to 100% more
stops a day



"DAYBROOK POWER GATES® are the only reason we stayed in business... began showing profit immediately after installing them... now make *twice* as many deliveries with one less man per truck"
— J. E. Ray Delivery Service, Dallas, Tex.



"Our POWER GATE-equipped trucks make at least 33% more pickups and deliveries... reduce damage claims and personnel injuries... practically no maintenance, either"
— Tamiami Freightways, Tampa, Fla.

Figure what 33% to 100% more stops a day could mean to your delivery picture — lower equipment and labor investment—safer handling—higher net profit! POWER GATES easily fit any truck — 25 models from 800 to 5000 lbs. capacity.

FREE BOOKLET SHOWS YOU HOW TO CUT DELIVERY COSTS!

Call your Daybrook Distributor today for the factual savings guide, "Proven Cost Savings in Handling", or write Dept. MH4, Equipment Division, Young Spring & Wire Corporation, Bowling Green, Ohio.



EQUIPMENT DIVISION
**YOUNG SPRING &
WIRE CORPORATION**

Manufacturer of
DAYBROOK Truck Equipment—OTTAWA Construction Equipment

Circle 138 on Reader Service Card

112



ASSOCIATIONS

NWPMA

The wooden pallet industry set an all-time production and sales record during 1960. Members and guests at the recent 14th semi-annual meeting of the National Wooden Pallet Manufacturers Association were told that last year's sales were \$162,811,000. This represented an 8.8 percent increase over 1959 in dollar volume. Previous record was set in 1959 with \$149,203,000. NWPMA predicts that 1961 production will be around the 1960 figure. Taking over the presidency



of the association is Arthur S. Binley, Jr. (right) of Hudson Falls, N.Y. He is shown accepting the gavel from retiring President Calvin A. Dorr of Portland, Oregon. The annual meeting was held in Litchfield Park, Arizona. Other 1961 officers are: Donald M. Drake, and Gordon W. Dennis, vice presidents; Frank H. Woodward, treasurer; and William H. Sardo, Jr., executive vice president and secretary. NWPMA awarded a citation for outstanding service to one of its industry leaders at the Litchfield Park meeting. Honored was a past president, Thomas N. DePew, of St. Louis, Mo.

FPBA

"What Makes For Success in the Folding Carton Industry?" was the theme of the annual meeting of the Folding Paper Box Association of America March 20-23 at the Drake Hotel, Chicago. Preceding the opening session were seminars on "A Profits Improve-

ment Program—Cost Reduction." The 1961 Folding Carton Competition and educational exhibits were opened March 20. All entries in the competition were on public display March 23.

The Folding Paper Box Association of America has presented its 1960 Director's Safety Award to three folding carton manufacturers in recognition of 5 consecutive years without lost-time injuries. Honored are: Standard Packaging Corp., Gebhart Plant, Dayton, Ohio; Intercity Box and Paper Co., Freeport, Ill.; and the Chas. J. Schmitt Co., Inc., San Francisco. The safety program was started in 1951, with 173 folding carton plants participating today.

MHI

The Material Handling Institute Eastern States Show and Conferences will be held at the Trade and Convention Center, Philadelphia, May 9-11. General conference chairman is Robert B. McKee, of the Sun Oil Co.

AMHS

Gordon E. Brunson spoke recently at a meeting of the Denver Chapter of American Materials Handling Society, Inc. His subject: "People, Materials, and Profits." Brunson, a partner with Reynolds, Merrill, Brunson and Associates explained how closely meshed the three are, and how people and materials can become tremendous problems and affect profits favorably or adversely.

Houston Chapter of AMHS heard a discussion recently by personnel from Lypta Cranes, Inc., of Sugarland, Texas. "Material Handling in Difficult Situations" was the subject.

William Sardo, executive vice president of the National Wooden Pallet Manufacturers Association was guest speaker at a recent New Jersey Chapter AMHS meeting. His subject: "Palletized Handling—Present and Future." He described the new West European pallet pool.

MATERIAL HANDLING ENGINEERING



Good lift trucks have one thing in common . . . **CASCADE ATTACHMENTS!**

It's what's up front that counts! That's why men who know attachments best select CASCADE to handle paper rolls, oil drums, concrete pipe, cotton bales . . . canned, boxed or bagged goods. Just about any load you can name gets a lift out of CASCADE, the world's leading attachment specialists.

CASCADE attachments will pick up your products *and profits*. Sold through all lift truck manufacturers and dealers.

Need a new attachment in your industry? Let us know, because . . . *the business end of a lift truck is our business.*

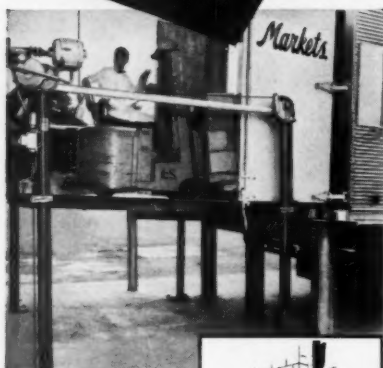


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Plants: Portland, Ore.; Springfield, Ohio; Amsterdam, The Netherlands

cascade manufacturing company

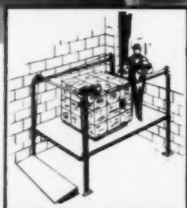
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GLOBE LIFTS SAVE TIME



Electro-Loaders® speed unloading with Lift Trucks

Ground-level plants without loading docks use Electro-Loaders so that lift trucks can enter truck body for palletized loads, eliminate manual unloading. Electro-Loaders have capacities to 6000 lbs., lifts to 5' 10".



Bridge Lift short-cuts traffic over rail spur

When spur tracks cut through floor areas, Globe Bridge Lifts provide direct access to all areas, eliminate long detours required to go around tracks. Two cylinder size shown carries 20,000 lbs., has lift of 4' 2". Models available to meet your requirement.

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TODAY

for complete information on GLOBE LIFTS. Globe Hoist Company, East Mermaid Lane at Queen Street, Philadelphia 18, Penna.

GLOBE LIFTS

PLANTS: PHILADELPHIA • LONG BEACH, CALIF.

Circle 53 on Reader Service Card



INDUSTRY NEWS

Weber Marking Promotes Wagner and Davies

Thomas C. Wagner has been named director of marketing and Roger B. Davies is now advertising manager at Weber Marking Systems, Inc.

Wagner was advertising and sales promotion manager for the last three



Wagner



Davies

years. He previously worked for Continental Casualty Co. and Socony Mobil Oil.

Before joining Weber, Davies was with the Advance Transformer Co. and the Benjamin Electric Division, Thomas Industries.

American Pulley Names Material Handling Manager

Robert E. Cagney has been named manager of the Materials Handling Division of the American Pulley Co. In his new position, he will be responsible for the co-ordination of the company's material handling equipment sales, and for the development of new



Cagney

products.

Cagney has several years' experience in the material handling field, including industrial selling. He will headquarter at the company's main office in Philadelphia.

Cambridge Wire Promotions

Harold E. Pink has been elected vice president of the Cambridge Wire Cloth Co. He has been with the company 27 years. Since 1944, he has

been assistant to the president in charge of the Wire Cloth Division. In 1949, he was elected to the board of directors, and in 1953, to the office of secretary of the company.

John B. Hanson, formerly manager of internal sales of the Wire Belt Division, has been appointed general sales manager. He will direct the work of the company's 12 sales engineering offices throughout the United States, Canada, and Mexico.

Bell Promoted At Tier-Rack Corp.

F. Andrew (Bud) Bell has been promoted to vice president and general manager of Tier-Rack Corp.

Bell joined the company in 1956 and became sales manager in 1958. Prior to that, he was a manufacturer's representative, and a district sales manager for Chrysler Corp.



Bell

In his new position, Bell will be responsible for all company operations. He will coordinate all company activities in sales and sales promotion, advertising, engineering, inspection and testing, manufacturing liaison, and new products development.

Maico Names Sales Head

W. H. Schaumberg has been named director of component sales for Maico Electronics, Inc. Before joining Maico in 1954, Schaumberg did design analysis for Minneapolis-Honeywell's Aeronautical Division.



Schaumberg

Schaumberg will have sales responsibility for Maico's Dynamu magnetic head line, all special instrumentation and digital heads, and industrial automation components. His most recent position with Maico was director of all development engineering.

MATERIAL HANDLING ENGINEERING



THE RAYMOND CORP. has entered into a partnership with Conveyancer Fork Trucks Ltd. of Warrington, England. The new company, under joint ownership, will make Raymond electric trucks and other Raymond products. The new company will be called Conveyancer-Raymond Ltd. Pictured left to right after signing formation papers are: A. G. B. Owen, C. W. Sharp, and George G. Raymond, Jr.

Mathews Conveyor Subsidiary Contracts New Plant

Mathews Conveyor Company West Coast, a subsidiary of Mathews Conveyor Co. will move all manufacturing operations into a new plant in Chico, Calif. in July.

For a trial period, engineering and manufacturing operations will be separated. Engineering will remain in the Bay Area, probably in San Carlos. The present facility there, however, will be sold.

The new plant will have 78,000 sq. ft. of manufacturing space and 7,000 sq. ft. of office space.

Minneapolis-Moline Names Trumpis VP—Manufacturing

Robert A. Trumpis has been elected vice president in charge of manufacturing for Minneapolis-Moline Co. He recently joined M-M, having been with the Norair Division, Northrop Corp.



Trumpis

Robert Rittmaster, vice president of Rittmaster & Co., Inc. has been elected chairman of the board of Minneapolis-Moline. Rittmaster, 35, has been a director of Moline since 1957.

Raybestos-Manhattan Elects Executive Vice President

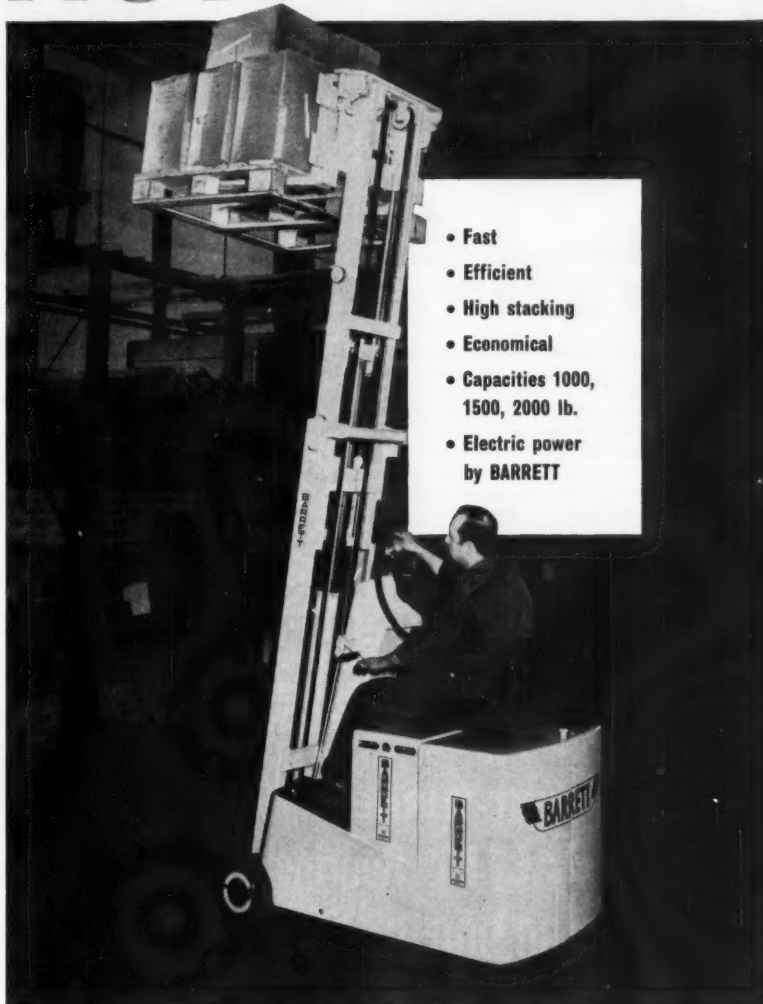
S. R. Zimmerman, Jr. has been appointed executive vice president of Raybestos-Manhattan, Inc. He is a director and vice president of the corporation. He also serves as general manager of United States Asbestos, Grey-Rock Division at Manheim, Pa.

Zimmerman is also in charge of the Pacific Coast Division at Fullerton, Calif., and is director of Cassiar As-

Continued on page 116

NOW

high lift stacking truck anyone can afford



- Fast
- Efficient
- High stacking
- Economical
- Capacities 1000, 1500, 2000 lb.
- Electric power by BARRETT

Versatility, speed and efficiency produce economy. That's what Barrett's new Model TTR Sit-Down Rider Fork Truck offers.

This Model TTR goes everywhere. Congested areas and narrow aisles present no problem for the short turning radius of the TTR. Unsurpassed stability with triangle-type 3-wheel floor contact. Quick and easy to maneuver, with automotive-type steering wheel, 4 speeds forward, 4 reverse—up to 5 m.p.h.

Additional features include handy controls; new, single-package gear drive; quick accessibility. Write for complete details and prices—Model TTR Bulletin 599.

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Temp-R-Tape eliminates sticking problems and undesirable accumulations. No materials, even those of a sticky, or viscous nature will adhere fast to its slick, wax-like TEFLON surface. Pressure-sensitive . . . it's easy to apply . . . easy to remove . . . reduces the down time involved in sprayed or baked-on Teflon surfacing. Temp-R-Tape has a useful temperature range of -100°F to 500°F . It's odorless, non-contaminating, non-absorbing and durable.

NON-STICK USES: heat sealing bars; forming plates, dies and bars; labelling rollers; chutes; hoppers; gussets; fins; guide rails.

AVAILABLE FROM STOCK: $\frac{1}{4}$ " to 2" widths, 18 yd. and 36 yd. rolls and 12" widths on liner by lineal yd. Special roll widths slit to order. Sold through distributors.

FREE SAMPLE and folder — write, phone or use inquiry service.

ELECTRICAL AND INDUSTRIAL SPECIALTY TAPES

CHR CONNECTICUT HARD RUBBER CO.

• duPont TM

Main office: New Haven 9, Connecticut

INDUSTRY

NEWS

bestos Corp., Ltd., in Canada. He is also a director of the Lancaster Manufacturers Association of Lancaster, Pa. He has been with the Grey-Rock Division of United States Asbestos since 1932.

Union Steel Products' Promotions

Paul Ewbank has been named first vice president and assistant general manager of Union Steel Products Co. He has been with the company since 1922. His most recent position was vice president and manager of the Administrative Division.



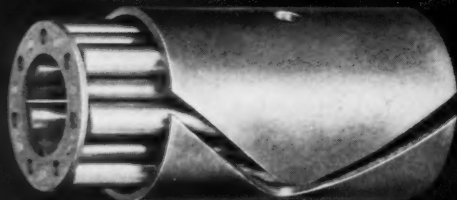
Ewbank



Butters

In other company changes, Leonard Butters was appointed secretary.

CORLETT-TURNER
The **QUALITY** Bearing
in the 90,000 Series



unexcelled { **MATERIALS
CONSTRUCTION
FINISH
PERFORMANCE**

C-T ROLLER BEARINGS

provide maximum service life at lowest possible cost. Widely used by major material handling, caster, wheel and farm equipment manufacturers. Write for Catalog and Specification sheets today.



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INSTANT COST REDUCTION

IN

- PACKAGING ● ASSEMBLING
- SORTING ● INSPECTING



the original

UNITABLE®
BELT CONVEYOR

Products start flowing, you start saving when you move in a Unitable belt conveyor. Assemble it yourself — even alter it yourself when you need a change in side leaves, lengths or speed. Thousands of Unitable Conveyors have paid for themselves many times over. Here's conveyor equipment within anyone's budget!

Circle on inquiry slip for full information and specifications.

CONVEYOR SPECIALTY

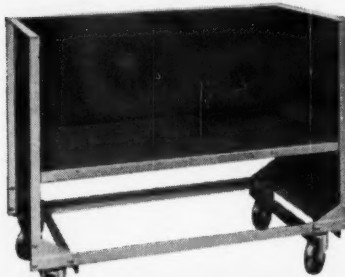
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VERSATILE
ALL-PURPOSE TRUCKS
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FIRST IN QUALITY

27 standard style and 150 standard size platform, shelf, tray, rack, stake, bin, box and table trucks to select from. Special sizes can be furnished.

Write for Complete Information on Wilder's Full Line of Production Handling Equipment

WILDER MFG. CO., INC.
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25TH & HAYTHORNE TERRE HAUTE, IND.

Circle 136 on Reader Service Card

April, 1961

Union Metal Names General Sales Manager

Kenneth C. Dorland has been appointed general sales manager for The Union Metal Mfg. Co. He succeeds the late Louis F. Heckmann, former vice president in charge of sales, who died Jan. 14.



Dorland

Dorland has been with Union Metal since 1925. Since 1958, he served as manager of all outdoor lighting products.

Distributor Anniversary

Celebrating its 32nd anniversary is the Morrison Co., a distributor in the Cleveland area. One of the oldest independent Hyster distributors, the company was founded by Harry Morrison. At the time Morrison was a manufacturer's representative for Nutting Truck & Caster—a line which the company still carries.

CLASSIFIED ADVERTISING

Rates: Cost of all ads in this section is \$20 for the first inch and \$15 for each additional inch or fraction. Rates for display ads in this section will be sent on request. All classified advertising is payable in advance.

MATERIAL HANDLING ENGINEER

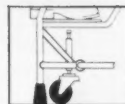
World-wide corporation has a need for an experienced industrial engineer who has specialized in material handling problems. Work is of a diversified nature involving most all types of equipment. The person selected must have the initiative and ability to handle a project from beginning to end. I. E. degree required. Prefer 2 years related experience. Salary commensurate with ability. Send resume with salary requirements to MATERIAL HANDLING ENGINEERING, Box 4161.

SALES MANAGER

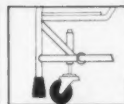
Conveyor Equipment Manufacturer
Chicago Location

Requisites: At least 5 years sales experience in material handling; M.E. Degree; experience in managing salesmen and setting up dealers and agents. Substantial salary plus incentive bonus. Write Box 4261, MATERIAL HANDLING ENGINEERING.

GO UP WITH
CONFIDENCE ON
BALLYMORE
Safety-Step
LADDERS



GRIPS THE FLOOR



ROLLS EASILY

Now . . . Ballymore combines welded steel or aluminum safety treads with wide-base pyramid design to offer extra safety and stability. Ballymore ladders let you climb quickly . . . and with confidence—any required height up to 15 feet. Spring-mounted casters that retract when you step on the first step is another safety "plus." They let you roll the ladder easily, yet grip the floor surely to provide safety at all levels.

All welded, corrosion-resistant Ballymore Safety-Step Ladders are available in four types—with 47 models to choose from. Step up to a new standard of safety today.

WITHOUT HANDRAILS



WITH HANDRAILS



For illustrated catalog covering complete line, write to



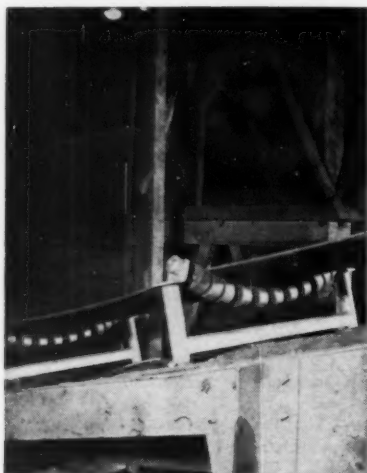
BALLYMORE COMPANY,
WEST CHESTER 5, PA.

BALLYMORE
EQUIPMENT FOR WORKING
Safely ABOVE FLOOR LEVEL



Call your
LOCAL DISTRIBUTOR

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**This conveyor idler
can handle abrasive
or corrosive material
The JOY Limberoller®**

Sand, gravel and other abrasive materials are no problem for Joy Limberoller belt conveyor idlers. The entire idler is made of neoprene discs molded to a flexible steel cable. The ends of the cable are swaged into bearings mounted in swiveling support brackets. The bearings are up out of the dirt—away from spilled material. The neoprene cable covering and molded discs are impervious to the attack of most chemicals which corrode steel.

If you have problems handling bulk materials that are abrasive or corrosive the Limberoller can be an immediate solution. They can be quickly installed on your present equipment. For complete information, write for bulletin 2759-90.

JOY

**Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.**

**In Canada: Joy Manufacturing Company
(Canada) Limited, Galt, Ontario**



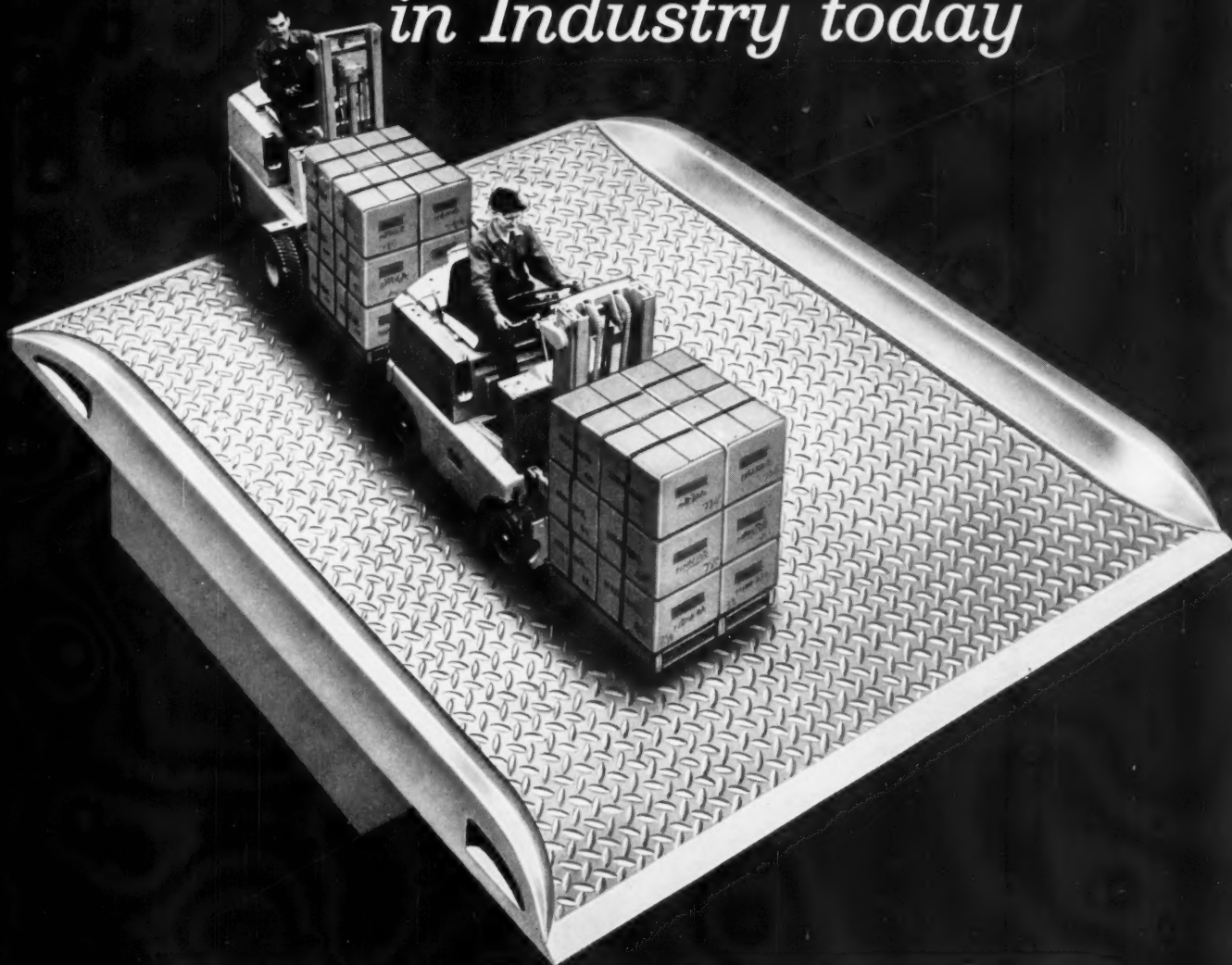
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The Big Board

in Industry today



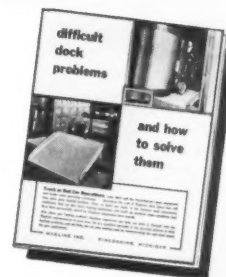
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This experience-packed brochure tells you why Magliner Magnesium Dock Boards are used by more companies—why they are the “Big Board” in industry today. Because every dock and every loading problem is different, it’s important for you to know which kind of dock board equipment will do your job best! “Difficult Dock Problems and How To Solve Them,” tells you what to look for in choosing the right kind of dock board to meet *your specific* requirements.


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Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario



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"Well, maybe
that's it . . . but are
you sure it will do
the trick?"

"No doubt about it!
I saw one just like it in
**MATERIAL HANDLING
ENGINEERING.**"

Problems are meant to be solved . . . and chances are good someone else is tackling a problem like yours this very minute. It's also a good bet that something seen or read in **MATERIAL HANDLING ENGINEERING** has helped provide the best solution. **MATERIAL HANDLING ENGINEERING** is written by specialists for men like you. It is edited to solve problems in material handling. You are sure to find solutions to many of your problems between the covers of every issue. Take advantage of the **MATERIAL HANDLING ENGINEERING** problem-solving content. And, for full details on any item described or advertised in this issue, just use the handy Reader Service Cards.

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